The Builder.

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Characteristics of French Gothic.

IT is an interesting inquiry whether the enthusiastic admiration for Continental Gothic survives which a few years back so powerfully affected the course of the Gothic Revival, and which widened its claim from being the distinctively English style, as patriotically expressed in the Tudor or Elizabethan of the Houses of Parliament competition, into the more serious one of being the universal representative of all that was sincere and Christian in architecture. We have progressed in the breadth of our artistic sympathies; interest and beauty are now recognised in all the Historic styles with a benevolent catholicity that would have been impossible a generation ago, and our eclecticism permits not only the impure Transitional epochs of developing styles to be recognised as productive of good architecture, but finds in the decadent periods material for serious as well as merely decorative design. Having thus, with the close of the century, almost run through the whole gamut of the scale of the Historical styles, and having tried in turn Greek, Italian, and all the phases of Gothic and English and Foreign Renaissance, down to Portuguese Plateresque, we may well reflect whether architectural Revivalism has left us with a new enlightenment as to the genuine architectural worth of what may be, for brevity's sake, termed French Gothic. The church building and cathedral restoring era has spent itself, and the architect of to-day has no immediate circumstances to compel his attention to the Mediæval styles. He is accustomed, with a considerable detachment of mind from the necessities of his daily practice of design, to consider, admire, and describe the beauties of the Parthenon. He can be safely enthusiastic about the refinements and esoteric mathematics of Greek architecture, both of these artistic sciences being impracticable in his art of day by day, beyond the limits of the narrow and unartistic field of iron-girder design. But can he play the dilettante with an art so near home, accessible and cheap, as French Gothic, or be conscientiously enthusiastic about any buildings upon tourist routes, and enjoy an art without the charm of novelty? Ruskin has awakened an interest, and created an influence that spread wider and deeper, upon the narrow basis of Venetian Gothic architecture, than that of the luxuriant Mediæval architecture of France, which gave origin to the "Bible of Amiens." William Burges, Viollet-le-Duc, G. E. Street, and Nesfield, with a host of sketching and measuring students, have lived, worked, and gone before in the single-minded faith, consistently maintained and splendidly illustrated by their hands and buildings, that we have in French Mediæval architecture an art as sincerely æsthetic and truthful as that of the Parthenon, and that this art possesses tokens in its highest developments of the dawning of a beauty in the subordinated arts of sculpture and decoration that can be described as Grecian. How rapidly has not the stream carried us away from such idyllic hopes! Who now studies the embryonic graces of the sculptures of Rheims and Chartres, and sees in their rapidly-loosing archaisms the bursting into life of that expressive force, the very life of art, that we all blindly strive for and so little understand?

It is there; however, the monuments remain, the persistent spirit of Burges still speaks in his drawings, in the traditions of his vellum sketch-book, and permanently in his cathedral at Cork. Is not the "Dictionnaire Raisonné" on most of our bookshelves? Are its diagrams less wonderful, still unrivalled in their entire understanding of motive, and delight in beautiful construction? Are not its seldom-opened covers witnessing to a lost ardour, and perhaps to a general fall in the barometer of architectural enthusiasms?

A collection ot photographic prints of some of the French Cathedrals, recently published, lies before us,* and recalls the interest and delight of this field of past studies. Though small and insufficient for any useful purpose to the architect, and scarcely picturesque enough in selection to be popular, these prints enable one to review a series of monuments that exhibit the most astonishing development of architectural genius in a nation that the world can show. Within the narrow limits of the thirteenth century, France produced the cathedrals of Paris, Chartres, Amiens, Rheims, Beauvais, Bourges, all works of the grandest scale and loftiest imagination, while Rouen, Laon, Senlis, Sens, Coutances, St Denis, and abundant abbeys, churches, and fragments, illustrate the artistic wealth and constructive power of the architects of those few generations. The audacity of such internal effects of height and lightness as presented at Beauvais, Bourges, and Amiens is completely justified by the constructive science which has poised their vaults overhead. The attempt, though it may seem to us overweening, is pre-eminently characteristic of architectural daring, an element often forgotten but present in all great architecture, and traceable from the Pyramids of Egypt through the Temple of Solomon, the Pantheon, the French cathedrals, Michelangelo's St. Peter's at Rome and Sistine Chapel, down to such unalleviated examples of constructive ambition as the vain Parisian Eiffel Tower, or the splendidly justifiable though sadly unæsthetic Forth Bridge. The world has no finer examples of soaring ambition in internal effect than these cathedrals of thirteenth-century France afford.

It is, doubtless, the case that such results are little more than the rapid developments, precocious and forced, of a Gothic type of cathedral building. Granted a vault, nave and aisles, arcade, triforium, and clearstory, and by a simple extension of the factor of height to its utmost constructive possibility, these internal effects which excite our wonder are arrived at. We admit this to be the case, and, remarking that simplicity of method and obviousness of achievement are among the elements of all simple and great architecture, claim that the highest exercise of imaginative design underlays the planning of these buildings. In scope of artistic imagination and in poetic conception the French architects of the thirteenth century are not behind their brethren of any other race or period.

The tide of architectural genius turned soon after to Italy, and in the production of the Renaissance more deeply affected the artistic course of the world than any other similar movement in its history, but the flame of imaginative genius burnt more brightly in the Mediæval darkness of the thirteenth century in French architecture than anywhere else. Rigid and essential as was the type-mould of cathedral building, the French art was too spirited to be confined alone to the embellishment of charmingly picturesque

* *Cathédrales de France;* a portfolio of photographs published for the "Commission des Monuments Historiques." Paris: Paul Robert. London: B. T. Batsford.

chevets with pinnacles and turrets; all this was most thoroughly done, the mouldings, shaftings, carving, crocketing, and decorative arcades are as finished, apt, and piquant as French delicacy of fancy can make them; but fields for further and greater play for imaginative design were sought for and found.

With the striking exception of Peterborough, and perhaps of Lincoln, Wells, and of Salisbury with less satisfactory results, English Mediæval architecture offers no serious attempt at original imaginative design. Italian Mediæval architects were on the other hand, always attempting imaginative composition by unsatisfactory means, and German zeal was too erratic and plagiaristic to be easily comprehended. In France however at the same period, there was a definite advance made and gain obtained for the architectural art of the world, in the combination with the æsthetic engineering, if we may so describe their method of cathedral construction, of an artistic composition of line, constructed and achieved for the sake of imaginative architecture alone, apart from the expression of the mere anatomy of the building. The west front of Notre Dame, Paris, is a good example of such an exercise of art. The vertical expression so inseparable from Gothic buildings is recognised and admitted as a necessity, but an imaginative love of breadth, of contrasting elements in design, and of dignity of proportion, though foreign and unnatural to the particular building, led the architect along the path of truly artistic design; the squarely vertical towers are harmonised and united into a composition of just proportions by the employment of an unbroken horizontal open arcade, delicately veiling the gable of the nave, and thus filling in the awkward spandrels formed by a pointed gable overmastered by taller towers. The proportions of the whole composition are adjusted by these new æsthetic elements of breadth and of the rational contrast of horizontals with verticals, satisfactorily to the intellect, and in a manner restful to the judgment of the eye, and therefore possessing true and perpetual value; all the natural lines of the front are subdued to the new principles; the western porches, the wonderful arcade of niches and statues above, and the features of each story, are simply grouped and concentrated upon the new lines, with abiding results then entirely novel to architecture.

The west fronts of Amiens and Rouen exhibit the same motive. Rheims is a more ambitious exhibition of the new art, and though the western front is not as satisfactory by any means as that of Paris, the north transept displays a magnificent composition and concentration of ornamental features, distinguished by the same feeling of breadth and power as the front of Notre Dame.

That this spirit laid hold of French Mediæval architects and their successors may be evidenced by the two illustrations that we publish this week* from M. Robert's collection, assuming that Notre Dame and the other principal cathedrals that we have mentioned are sufficiently well known to our readers. Dijon is a picturesque and charming example of the fourteenth century, illustrating the erection of a façade with the concentration of ornament upon a comparatively small scale, but with a definite motive in the composition. Angers similarly, though not the work of one period, shows an interesting attempt in the sixteenth century, by the erection of a screen of canopied niches between two ornate western towers of the twelfth century, to emulate the fronts which formed distinct architectural compositions. The result is picturesque and quaint in the extreme, but must serve as an illustrative warning, of the danger of attempting by later additions to graft a new motive of design upon an interesting earlier work. Apparently the architect of the sixteenth century who improved the twelfth century towers was himself improved upon, and his idea of composition carried one step further in the direction of the ridiculous, by the later addition of the competing cupola between the two towers.

Interesting as is the study of motives in thirteenth-century design in the French cathedrals, the wonderful beauty of the subsidiary arts during that period must not be forgotten. An archaism pure and refined, earnest as of the period of the Crusades preached by St. Bernard at Chartres, is melting into freedom and beauty in The Virgin of Amiens and The Christ of Rheims. The didactic purposes of sculptured art are in these cathedrals at their acme of usefulness and power, and it is fervently to be hoped, that in whatever directions the art student may seek for inspiration, the pure and luxuriant supply afforded by the French cathedrals of the thirteenth century may never be neglected, or become again the mere "Gothic" of pre-Revival days.

Beyond all this, in more archæologically interesting periods and buildings, France possesses Le Puy, with its volcanic polychrome buildings; Périgueux, so interestingly revived by M. Phené Spiers at the Institute lately, Toulouse, Vézelay with its purer Gothic Madeleine, Albi and Pamiers with a majestic brick architecture unrivalled in scale, and a series of examples of each phase of picturesque as well as of more noble art, all well cared for, accessible to the student, and in every way characteristic of the great nation which gave them birth, and which is still leading the way in many paths of architectural progress.

* See lithograph plates.

STUDIES AND DRAWINGS BY SIR E. BURNE-JONES.

THE collection of studies and drawings by Sir E. Burne-Jones, now on view at the gallery of the Society of Fine Arts, forms a very good representation, in a concentrated form, of the quality of his genius as an inventor and designer, apart from the influence of colour which constitutes so important an element in his finished pictures. Just as in music we may sometimes form a more correct estimate of the value of the musical idea by considering it in its essential and simplified form, apart from the adventitious interest produced by what is called "orchestal colouring," so in the case of the painters' productions, one may be justified, on such an opportunity, in considering his ideas in the pure form of line and composition, as we have them here in this case, apart from the influence of colour; an influence which, in some respects, affects the eye rather than the mind.

The catalogue of the exhibition is prefaced by one of those optimistic critical essays, or essays professing to be critical, which it is now the fashion to prefix on such occasions: a fashion to which we have the strongest objection. If we are invited to such an exhibition, as may be assumed, to form our own judgment of the works exhibited, it is an impertinence to thrust upon our notice the opinion of some one else, who may be and probably is no more competent to form an opinion than most of those who visit the exhibition. And Mrs. Ady's essay attached to the catalogue contains one or two statements which one is disposed to resent the more because they are in direct contradiction to the evidence of our own senses. In connexion with the semi-grotesque design of two children playing with cats (146), or rather tormenting them, we are asked to recognise this as an evidence of "the strong sense of humour which is so marked a feature" of the artist's character. The public have nothing to do with the artist's character, except as shown in his works; and in the productions on which his reputation as an artist is based one of the most marked characteristics of Sir E. Burne-Jones's art is its entire deficiency in the quality of humour. And when we are asked to accept this in many respects great artist as an illustrator of Chaucer, this point becomes of some importance. Chaucer is the greatest master of humour in English literature next to Shakespeare, and in that light Sir E. Burne-Jones is one of the very last painters who should have been selected to illustrate his works. The sketches of Chaucer subjects in the collection show this emphatically. They are totally destitute of humour. What they have which may be supposed to be in common with Chaucer is a certain naïve archaism; but this in fact is out of place. Chaucer's archaism only exists in the half-formed character of the English language at the time he wrote; in his ideas and feelings he is one of the most modern and human of all English writers.

Then we find a reference to "these fair women, with the mysterious smile on their lips and the look of infinite sadness in their eyes; these faces so alike in their type of beauty, so unlike in their endless variety of expression, have all the spiritual refinement of Lionardo's art." The last sentence is true; there is a good deal of resemblance between the Burne-Jones type of face and the Lionardo type of face; but it is just one of Lionardo's weaknesses that he is always giving us the same type of face in his women; and as to the "endless variety of expression," what is the use of telling us that when our own eyes tell us the contrary —when we know that one of the weaknesses of Sir E. Burne-Jones's art is that, whatever the situation, the expression of his heads is nearly always the same? It is foolish to place in a catalogue statements which every one with eyes in his head knows to be untrue.

What strikes one most forcibly in this collection of studies is that they are the work of an artist who has absolutely made a style of his own, independent of anything else in contemporary art; who has a keen sense of beauty but is deficient in power and variety of expression; and who is a master of the decorative treatment of lines and spaces. This latter quality is seen nowhere in more marked form than in the

beautiful series of designs, mostly in circular panels, for the story of Orpheus (Nos. 125 to 134). The manner in which all the lines of figures, draperies, and symbolic accessories, fall into purely decorative form in these designs is remarkable. The delineation of Cerberus, too, is notable for its originality and the manner in which a certain anatomical consistency is given to the three-headed monster. Yet at the catastrophe, "The Regained Lost," where in three successive designs we see Eurydice torn away from the arms of her lover, we find the element of weakness again—the want of power of expression: Eurydice, at the crisis, retains the same gentle melancholy simper which characterises all the heads. Beauty, of a rather artificial and affected kind, is within this artist's grasp; power and dignity of expression are not. His figure of "Fortitude" for instance (7), is pretty, but as the symbol of so strong a virtue it is about as weak a figure as one could have. The designs for the Æneid are charming in decorative effect, but the illustration of the famous phrase "vera incessu patuit Dea" is almost ludicrously inadequate; the figure of the goddess has no superhuman nobleness or dignity, it is just one of the usual thin figures in highly artificialised drapery. And what about the drawing? The very first figure that comes opposite the eye in the range of drawings—the upper figure in No. 2, "Study of Drapery for the Briar Rose," is hopelessly wrong. The figure is seated; look at the proportionate distance between the "seat" and the waist, in a figure too which is partially leaning away from the spectator, and therefore must to some extent be foreshortened in the trunk. Look at the position of the breasts in the centre figure of No. 18; look, above all, at the figures in the sketches for "The Romance of the Rose"—No. 120 for example, with the absurd disproportion between the size of the heads and the length of the bodies; and at Pluto in the "Rape of Proserpine" (54), a great mass of drapery with a head the comparative size of a small cocoa-nut on the top of it. Is this sound art? Or are we to accept the principle that a painter who is eminent in other qualities is to have licence to draw the human figure as he pleases?

Among the things which represent the highest qualities of Sir E. Burne-Jones's art are some of the numerous studies of heads, always beautiful though far too monotonous in their beauty. One which forms an exception is the "Study of a Head" on red paper (58), which is not only one of the most beautiful things in the room, but has an individuality and humanity of expression which distinguishes it from the others. Many of the studies of drapery are very fine, particularly those for the angels of the "Days of Creation" (9), which show what effect and variety the artist can give to a simple form of drapery in which the main tendency of the lines, for decorative reasons, is the same in each figure. The drapery studies numbered 31 are also specially admirable, as also all the studies for armour, which evince the greatest originality and sense of the picturesque in metalwork.

There is much to admire in the exhibition, but one cannot but see that when denuded of his glories of colour, and regarded merely as a designer, the author of these works is an artist whose powers, remarkable as they are in a certain sense, are confined within rather narrow limits, and that his art is founded rather on a poetic conventionalism than on nature.

NOTES.

The Paris Theatre Stores.

THE storehouses of theatrical properties and scenery in Paris are considered to be a danger to the houses near them. The Théâtre Français already has its magazines outside the city, and the properties of the Opéra Comique will also shortly be housed in the large building in course of erection for them near the line of fortifications, on the Boulevard Bessières. But many of the other theatres have their property-stores in the centre of the most populous quarter of Paris, and only a month ago the store-house of the Ambigu Theatre was the scene of a fire in which almost everything was destroyed. The Municipal Council is now demanding the suppression of all such existing theatre magazines as are not completely isolated, and the prevention of any future erection of the kind except in isolated positions. It is even proposed to classify stores of this kind as "dangerous structures" which must be put under police supervision. Public opinion in Paris appears to be entirely in favour of this view of the matter. It may be worth while to give some more attention to it in London.

The Snowdon Accident.

BUT for the fact that the Snowdon railway accident unhappily led to the death of one of the passengers—though this was due rather to his own indiscretion than to any unavoidable cause—one might be excused for regarding the catastrophe as a rather appropriate sequel to a scheme which was carried out in the face of the indignant protests of those who could not see the propriety of spoiling and vulgarising a grand feature of natural scenery for the sake of dividends to be derived from the pockets of cockney tourists. After this accident on the opening day, which fully demonstrated that the railway in its present condition at all events is not safe, it is not likely that there will be more passengers on it for a good while to come, and it is just possible that the result may be the removal of the line and the abandonment of a foolish undertaking.

St. Cross Hospital.

A CORRESPONDENT of the *Times* has done good service, apparently, in calling attention to the project of the Trustees of this ancient charity to erect a large new building, as an extension of the hospital, within the enclosure and close to the ancient buildings; for it is announced that the project has been abandoned. It appears that the Trustees are bound by the conditions of the Trust to expend their surplus funds in building and in thus extending their accommodation; but it was surely no necessary condition that they should build on the same site, as they seem now to have admitted, by proposing to acquire a new site for erecting a branch extension. It cannot be considered to be any false or exaggerated sentiment which objects to the intrusion of new buildings within the precinct of St. Cross. As a relic of the life and the architecture of an early period St. Cross has a quite unique interest and value; in entering into the enclosure one seems to step at once into the midst of a vanished century; and any new building added to the group would at once destroy its archæological interest and associations.

Edinburgh Castle.

ONE hears with some consternation that it is proposed to make extensive improvements and additions to the military buildings on the Castle Hill at Edinburgh. This would mean still further impairing the ancient character and appearance of the place, and it is very doubtful whether the site affords room for any enlargement of the existing quarters such as would really meet modern requirements. A correspondent of the *Edinburgh Evening News* states that the officers quartered at Edinburgh do not at all relish the Castle quarters, partly on account of the castle yard affording insufficient space for drill, partly on account of the exposed nature of the site and its difficulty of access; and that it would be thought far preferable to have completely modern barracks built on a flat site in some other part of the neighbourhood. If this is the case, it seems probable that further alterations to the Castle Hill buildings would only result in depriving the place of all remains of its ancient aspect, and would still not satisfy any one. With the desire of the modern officer to be made exceedingly comfortable in time of peace (he does not make any such demand in war) we have not so much sympathy; but we have a good deal of sympathy with Castle Hill.

By-laws in Rural Districts.

IN reference to the subject of the article in our issue of April 4, "Local Authorities and New Buildings in Rural Districts," Mr. Allan Greenwell, the Surveyor to the Frome Rural District Council, sends us a copy of a printed form drawn up by him, in accordance with instructions from his Council, which contains an abtract of all the building regulations in force in the district. A copy of this abstract is sent to any person who is known to be proposing to commence building operations within the district, so that he cannot complain of not understanding his legal responsibilities. This is a practice which might well be more generally carried out by Rural Authorities.

Quantity Surveyors' Fees.

THE result of the case of Bushell *v.* The Trust Agency and Guarantee Co., briefly reported in another column, in which the Judge ruled that the plaintiff, who had been engaged as Quantity Surveyor by the building-owner, was entitled to his fees on the amount of the lowest tender in spite of the fact that none of the tenders had been accepted, is of some importance both to Quantity Surveyors and to those who commission them. The judgment seems no more than what is in accordance with common fairness. The position of the Quantity Surveyor, in that the building-owner is liable to him before the acceptance of a tender, and the builder whose tender is accepted afterwards, is no doubt rather anomalous; but there is certainly no reason why the Quantity Surveyor, any more than the Architect, should lose his

labour because the building-owner changes his mind or indefinitely postpones the work, and the decision seems to settle the point for the future. It may be observed that the plaintiff had allowed a reasonable time to elapse before sending in his claim; this is an element in the case, as otherwise it might have been ruled that he had not given the building-owner time to consider his position.

Storage Batteries.

IN the April number of the *Journal of the Franklin Institute* there is an interesting paper on the evolution of the storage battery, by Mr. Barnett. Planté began his experiments in 1859, but the commercial applicability of the storage battery was not assured until Faure invented his pasted plates in 1880. So great an improvement was this supposed to be that for the next ten years practically the only batteries in use were of the pasted type. Unfortunately many of the early ones were sent out in a crude and undeveloped form, and their rapid deterioration created a strong prejudice against them. Recently batteries of the Planté type have again come into favour. The discovery of methods of making plates for Planté batteries in one-tenth of the time formerly required, as well as their capability of giving the heaviest discharges without sustaining injury, has stimulated invention in this direction. The "chloride" battery, which is extensively used in America, is of this type, and in the opinion of many engineers the negative plates of this cell are the best that have been made up to the present time. Some progress has been made with lead-zinc accumulators, and if the local action could be diminished further, they would prove formidable rivals to the lead accumulators. The further development of the storage cell, we hope, will be in the direction of reducing its weight and inventing a dry electrolyte. Such a battery would have a great future before it.

Leakage of Electric Current.

THE Council of the Society of Arts are offering the Fothergill prize of 25*l.* and a silver medal for a paper on "The best means of effectually preventing the leakage of current to earth in electrical installations from generating heat and setting buildings on fire." The Council have been fortunate in the choice of an interesting and important subject, and the competition is sure to be keen. The many different systems of supply and the various systems of wiring now in use, make it difficult to decide between the relative merits of the known methods for preventing leakage, and competitors will probably find that the most promising course is to try and find an original solution to the problem.

Insanitary Cowbridge.

ACCORDING to Dr. Bruce Low's report to the Local Government Board on the sanitary circumstances of the borough of Cowbridge, or rather its insanitary circumstances, these mainly arise from insufficient and polluted water supply and insufficient scavenging. There is no public water service in the borough. The central part of the town is supplied from a pump adjoining the Town Hall, which is the most satisfactory of all the local supplies in Cowbridge, but it is insufficient in quantity. The east and west ends of the town are served by five public pump wells, the deepest of which is only 29 ft. The water extracted from all these is more or less unsatisfactory. The well at the east village is little more than 20 ft. deep, and is sunk in limestone rock in which are many fissures. On the sloping ground around and above this well are houses furnished with deep cesspit privies, or with waterclosets drained to cesspools. The cesspools are merely holes dug in the ground, and their bottom and sides are not made watertight. It is stated that they *seldom or never need emptying*. Some indeed have never been emptied since the houses to which they are attached were built; others, within 18 to 25 yards of the well itself, had not, according to the statements of the occupiers, been emptied for the last three or four years at least. In wet or frosty weather, people are tempted to use the polluted water of this pump to save the time and labour necessary to procure their supply from the Town Hall pump. The Cowbridge authorities (the motto on whose official arms is "Let us go forward)," have hitherto obstinately refused to take any steps towards providing a better water supply.

A Splendid Salary.

THE ..orporation of Southport invite applications for the post of Architectural Assistant in their Borough Surveyor's Office. The applicant must be "a good designer"; probably it is intended that he should supply the æsthetic deficiencies of the surveyor, and, in fact, design the Corporation architecture; he must be able to prepare specifications and quantities "without supervision," and must have had experience in supervising the erection of buildings. All this implies the possession of ability beyond that of the average of architectural assistants, and the Corporation evidently feel this, as they offer him the magnificent salary of 80*l.* a year, to be increased in process of time to 140*l.* Do they really expect to get the services they require for such an offer as that?

Vanishing London.

SOME old houses have just been pulled down in London. The demolition comprises Castle-court, in Fulwood's-rents, High Holborn, and one of the two little houses adjacent in High Holborn (north side). There is a watercolour drawing of the latter, by T. Hosmer Shepherd in the Crace Collection, and in the catalogue compiled by John Gregory Crace they are described as:

> Two old houses, Nos. 28 and 30, High Holborn, said to have been built *temp.* Henry VI.—modernised 1852.

The one pulled down was No. 28; the one remaining is now numbered 29-30. In the portion of Fulwood's-rents that has been cleared away stood, we believe, the house, reputedly of James I.'s reign, which contained some good panelling and mantelpieces in carved oak. Views of the interior of two of the rooms will be found in J. W. Archer's "Vestiges of Old London," 1851, and in his watercolour drawings, 1852, in the Twopeny Collection, now preserved in the British Museum. On February 5, 1593, the benchers of Gray's-inn ordered a payment of 150*l.* to one Fulwood, "for a parcel of ground in Holbourne for building a gate out of Gray's-inn (Field-court) into Holbourne," as Mr. Douthwaite, the librarian, recites in his work upon Gray's-inn.

"Saltwater Studies."

MR. WYLLIE'S collection of small pictures (mostly watercolour) under this title at Messrs. Dowdeswell's gallery is a very interesting one, but perhaps the success and the interest lie more in the shipping than in the treatment of the sea, which, except in a few instances, is rather disappointing. We had regarded Mr. Wyllie latterly as a new sea-painter as well as a painter of shipping; but in many of these little scenes there is a certain heaviness and opacity in the sea which one does not enjoy. There are exceptions, among them "The Start" (64), and "The Old Chain Pier, Brighton" (92), the latter an admirable bit of rough water. The "Launch of H.M.S. *Victorious*" (5) reminds one that Mr. Wyllie's strong point is the ship itself. A number of the yacht pictures are admirable; "Dock Gates, Ipswich" (13) is a charming bit of colour; others that are specially good are "Steam Ferry, Felixstowe" (48), "Sheerness Pier" (58), "Upper Mussel Bank" (61), "Erith Pier" (74), "Port Victoria" (76), and "Brighton" (90).

Caillebotte's Legacy.

THE painter Caillebotte, who died two years ago, left all his pictures by will to the Luxembourg, but as some of these represented the extreme eccentricity of the Impressionist school, the Département des Beaux-Arts wished to exercise a right of selection. This the representatives of the artist refused to admit, and the Luxembourg authorities on their part were disposed to decline the legacy altogether. Ultimately however it has been agreed that out of the sixty-six pictures offered, the Luxembourg should select forty to be placed in the museum, where they will form a rather curious collection of examples of one school of French art in the nineteenth century.

The Olympic Games Record.

WE should like to warn our readers not to expend 10s. on the hideous publication, "The Olympic Games," the first part of which has been just issued under the patronage of the Central Committee in Athens, presided over by the Crown Prince. The version before us purposes to be in English and German, and is a translation from the original Greek. We say advisedly "purposes," for the mongrel production of "C.A." is no language at all, but a horrible compound of the loose verbosity of the worst form of modern Greek, with the clumsy pretentiousness of half-educated German. The text is disfigured further, if disfigurement were possible, by the vilest chromo-lithographs. The climax is reached in an ornamental cover, adorned by the figures of three bicyclists, bent double, racing round the port of the Peiraeus. It is melancholy to see such a production issued in connexion with a festival at Athens, of all places.

WHAT CAN BE DONE WITH GOOD CONCRETE.

THE architect has often to decide between a bad material and a good one, or between a good one and a better. If cost were no object, the decision would be easy, but as cost is, alas, only too prominent an object in these trading days, the decision is fraught with difficulty. It becomes necessary for the architect to weigh the bad and the good, the cheap and the costly, and to ascertain if the good material be worth its extra cost. How many architects and engineers in

days gone-by have troubled their brains about cast iron girders *versus* wrought iron, the weaker and uncertain material against the stronger and safer, the cheap against the more expensive. The balance of advantage was found to rest with the better and more costly material, and little by little the other fell into desuetude for the purpose named. Many instances could be found of similar struggles resulting in the survival of the fittest, although perhaps none so conspicuous as this between cast-iron girders and wrought iron. There is, however, one struggle now in progress to which attention may be drawn; it is that between bad concrete and good, or (perhaps more correctly) between good concrete and better or the best. The preliminary rounds in the contest have already been fought, and, so far, the worst materials have had the worst of the fight. Grey lime, lias and other hydraulic limes, and Roman cement have all been surpassed in strength and usefulness by Portland cement. The fight has now entered a new and interesting stage—Portland cement *versus* Portland cement, good concrete *versus* better.

A quality of cement is demanded nowadays which a few years ago it would have been impossible to obtain. To take the question of fineness alone: Twenty years ago the fineness of cement was scarcely considered; gradually, however, more and more stringent tests have been adopted, and to-day for important works it is often specified that all the cement shall pass a sieve of 2,500 meshes per square inch, and only 10 per cent. be retained by a sieve of 5,600 meshes; and not infrequently a still greater degree of fineness is required. Altogether a higher standard of quality is being adopted, because (up to a certain limit) the higher quality is, strength for strength, cheaper, while it is undoubtedly more reliable.

The same tendency may be observed in the quality of the concrete manufactured from Portland cement. Engineers have learnt by sad experience that it is false economy to use poor concrete for sea-works. Good concrete, with cement enough to render it impervious to the water, is the cheapest in the long run, although more costly at first. Mass, of course, is often a primary consideration in sea-works, and in this respect there is little difference between "rich" concrete and "poor;" but that mass alone is not sufficient to ensure durability is proved by the failures of the massive but pervious works at Aberdeen and Belfast. A tendency to use richer concrete for foundations is also observable; the old 1 to 10 or 1 to 12 mixtures are seldom used nowadays. Better concrete, and less of it, is the modern rule. And that it is a wise one, especially in relation to floors and roofs, is evidenced by the practice of those who may be called specialists in concrete-construction. In a recent issue* we drew attention to the good quality of the concrete now used for floors and other work in America. Not only is a strong cement required, and great care exercised in washing all dirt from the aggregate, and in mixing the ingredients, &c., but a greater proportion of cement is used in the concrete. One part of cement is used for every three parts of aggregate, and this in a system of construction where the tensile stresses are borne by iron rods. In Germany, too, the same tendency may be perceived; the concrete used in the *Monier* floors and arches contains only three parts of aggregate to one of cement, and in this case also iron rods are used to give tenacity to the concrete. The specialists in our own country have come to the same practical conclusion. Nearly all the well-known makers of artificial flags and paving adopt a ratio of 1 to 2 or 1 to 3 for cement and aggregate. And in the construction of flat or arched concrete floors and roofs the same proportions are observed. The large proportion of cement renders the concrete more uniform in substance, and therefore in strength, and it becomes possible to calculate beforehand the strength of a structure with some degree of accuracy. When concrete containing a large proportion of sand and aggregate is used, it is impossible to insure such a thorough mixing of the ingredients as to produce uniformity of substance; the sand and the cement will be more or less unequally distributed throughout the mass, and the strength of the structure will be determined by the weakest part. There is more risk in using "poor" concrete than "rich."

The practical value of good concrete is exemplified by some floors, roofs, and stairs, constructed by Stuart's Granolithic Stone Company, which have recently come under our notice. It is not customary for us to draw particular attention to the work of any one firm, but the details of these structures are so interesting and valuable that they cannot fail to be appreciated by many of our readers.

* See the *Builder* for September 14, 1895.

Table I. gives particulars of actual floors which have been loaded apparently for the purpose of setting at rest the minds of the owners or architects of the buildings in which they occur. We are not told whether the slabs were fixed at the edges or only supported, but assuming that the former is the case, and that they were fixed on *all* the edges, their strength is surprising. The "load carried per square foot," is, we are told, "the actual load which has been placed on the floors without injuring them." Figs. 1 and 2 illustrate the panelled and arched floors mentioned in the table.

TABLE I.

Strength of Tested Granolithic Floors.

	Span.	Thickness in inches.	Approximate weight per sq. ft. in. lbs.	Load carried per sq. ft. in cwts.
	ft. in.			
I. Flat	5 6	2	24	5·35
	6 0	3	36	14·55
	7 0	2½	30	11·62
	9 4	2¾	33	4·76
II. Panelled*	13 0	3	40‡	6·1
III. Arched†...	5 6	7½ to 2	—	6·32
	5 6½	do.	—	8·25
	9 0	10½ to 1½	—	23·6
	21 6	29½ to 3	—	8·14

* See Figure 1.
† See Figure 2.
‡ This weight includes a due proportion of the concrete beams which form part of the floor.

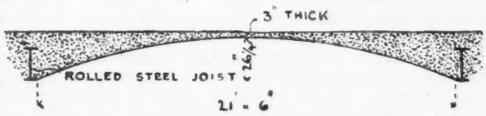


Fig. 1.—Section of Arched Floor.

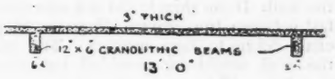


Fig. 2.—Section of Panelled Floor.

Table II. gives some details of floors and roofs which have been constructed by the company, but have not been tested. They are, however, as far as we can ascertain, fulfilling the purposes for which they were designed, and a record of them may be of service.

TABLE II.

Some Granolithic Floors now in Use.

—	Description.	Dimensions.	Thickness.	Where used.
		ft. in. ft.	in.	
I.—Flat...	1. Landing.	15 0× 7	2	Sale Rooms, Mincing-lane, London.
	2. Floor.	16 0× 9*	2¾	Selwyn College Chapel, Cambridge.
II.—Panelled..	3. Roof.	12 6×12†	2	Warehouse, Princes-street, Edinburgh.
	4. Floor.	12 6×19‡	3	Warehouse, Princes-street, Edinburgh.
	5. „	13 10×30§	3	Office, Mark Brown's Wharf, London.
III.—Arched ...	6. „	13 10 span	3 at crown	Warehouse, Mark Brown's Wharf, London.
	7. „	10 0 „	6 to 3	Greenhouses, &c., Eastwell Park.
	8. „	14 6 „	18½ to 3	Grain Warehouse, Swansea.

* These slabs rest on concrete arches which are 18 in. wide, and have a clear span of 14 ft. 6 in., a rise of 18¾ in. and a thickness at the crown of 2½ in. No metal girders are used in the construction of this floor.
† With 6 in. × 4 in. beam running under the centre transversely. The concrete is covered with asphalt.
‡ With 12×6 beam running under the centre transversely.
§ Size and number of beams not stated.

The architect of No. 1 is Mr. E. B. I'Anson, of No. 2 Sir Arthur Blomfield & Sons, of Nos. 3 and 4 Messrs. G. Beattie & Sons, of Nos. 5 and 6 Messrs. Stock, Page, & Stock, of No. 7 Mr. Wm. Wallace, and of No. 8 Mr. A. O. Schenk. If the figures given in the foregoing tables are accurate—and we have no reason to believe that they are otherwise—they certainly show that the strength of good concrete is much underrated by the profession at large. The surprising character of the figures is more noticeable when we compare them with those of other methods of flooring. At the same time, it must not be forgotten that "the load carried per square foot" (see Table I.), although it did not injure the floors, might be dangerously near doing so, and cannot by any means be regarded as a "safe load" in the ordinary acceptance of the term. In comparing these floors with others, this consideration ought to be borne in mind. The figures given in the first table show flat floors 5 ft. 6 in. span and 2 in. thick, 6 ft. span and 3 in. thick, 7 ft. span and 2½ in. thick, and 9 ft. 4 in. span and 2¾ in. thick. The loads per square foot vary from 4¾ cwts. to 14½. For floors of approximately similar spans calculated to bear safe loads of 500 lb. per square foot (4½ cwt.) the Ransome Company of Chicago suggests the following thicknesses:—5 ft. span, 4¾ in. thick; 6 ft. span, 6¼ in.; 7 ft. span, 6¾ in.; 9 ft. span, 8¾ in. But the Ransome floors include, in addition, twisted iron rods, ½ in. square, embedded in the lower part of the concrete, the distance apart of the rods varying from 10 in. for the 5 ft. span to 6 in. for the 9 ft. In a paper recently read before the Northern Architectural Association, Mr. Hobbs gave a table of the estimated strength of floors constructed of concrete and twisted iron or steel rods after the Ransome manner, the sectional area of the rods being $\frac{1}{60}$ that of the concrete and ⅔ of the area "being in the direction of the shortest bearing and ⅓ the other way." He estimates that such a floor, 5 ft. span and 4 in. thick, will carry a safe distributed load of 9·6 cwt. per square foot; one 6 ft. span and 4 in. thick will carry 5·2 cwt.; 7 ft. span, 3·9 cwt.; and 9 ft. span, 2·3 cwt. A floor 9 ft. span would have to be, according to Mr. Hobbs, 6 in. thick before it would safely bear 5·2 cwt. per square foot—a load only a little more than that borne by the granolithic floor 2¾ in. thick.

Comparison might easily be made with other methods of flooring, such as the ordinary floor of steel joists and concrete, and floors of steel joists, tiles, and concrete, but sufficient has been said to show the divergence of opinion and practice which unfortunately characterises this important branch of construction. When the Institute has completed its tests of brickwork, we may hope that the testing of concrete beams and floors will follow; the result of a comprehensive and careful series of tests could not fail to be of great interest and value to all engaged in the design and construction of buildings. Certainly in the present state of our knowledge there is grave reason to question the advisability of constructing floors of concrete alone as thin as some of those quoted above, and it appears to us particularly risky to construct a landing, which may be exposed to considerable wear, only 2 in. thick. It may be strong enough now, but will it be strong enough when the footsteps of three or four generations have passed over it? Be this as it may, the floors and roofs which we have described are object-lessons of the value of good material. A smaller quantity of good material will fulfil the office of a larger quantity of bad, and as a lower factor of safety can be used with the former, the saving of material is more proportionately than the difference in strength of the two materials would seem to allow. And the saving of material in floors and roof means also the reduction of dead weight on walls and foundations, often a matter of considerable importance.

DOVER UNDERCLIFF RECLAMATION SCHEME.

SIR E. LEADER WILLIAMS recently held a local inquiry at Dover on behalf of the Board of Trade respecting the Undercliff Reclamation Scheme, the Bill for which has passed its second reading in Parliament. The scheme is to reclaim the foreshore between Dover and St. Margarets, and to protect it by building a sea-wall, the length of which would be about three miles. A marine promenade would thus connect Dover and the rising watering-place of St. Margarets, and a number of valuable building sites would be provided overlooking the Channel

Lord Robert Cecil, who represented the promoters, went fully into the scheme, pointing out its value in protecting the foreshore, which at this point has been considerably encroached upon by the sea, and also its necessity for the extension of Dover to the eastward, especially in view of the construction of the new Government harbour, which will practically destroy the present marine promenades. Sir E. Leader Williams said he well knew the length of cliffs along which the wall was proposed to be constructed, having lived at Dover for three years forty years ago, and he could not but notice the great change which had taken place. Sir Wm. Crundall, who has been seven times Mayor of Dover, and is head of the timber firm of Wm. Crundall & Co., was examined as one of the promoters of the scheme. He deposed to the necessity of the works, and on the financial aspect of the question said he was locally interested in property to the extent of about 150,000*l.* Sir John Jackson, another of the promoters, and one of the largest contractors in the kingdom, next gave evidence. He said their idea was to build the wall as stated, and to protect it by groynes. He was pertectly satisfied that the sea-wall proposed would be strong enough for the purpose, he having built similar walls elsewhere, Eastbourne being an instance. The foundations would be three feet below the level of the chalk bottom. The average height of the wall would be twenty-three feet, and its length would be approximately three miles. Looking at the fact of the construction of the National harbour he should say that the Government would construct a wall on such portion of the cliffs as came within the harbour, and the road would run at the back of this wall to where their scheme commenced. When the groynes were put in and the shingle collected there would only be waves of two or three feet at the worst against the wall. If the shingle did not collect sufficiently fast between the groynes they would put some chalk débris to help matters. The backing for the wall would be provided by cutting away the cliffs. This was necessary in many cases for safety, as there were great pieces of cliff overhanging. Mr. E. Easton, the engineer to the scheme, explained the movement of shingle in connection with the falls of cliff. He said that engineers were all agreed that the shingle in the Channel travelled from west to east. Since 1892, when the preliminary surveys for the reclamation scheme were made, this had been shown in a very remarkable manner. A number of falls of cliff had taken place since that date, and in every case there had been a collection of shingle on the west side with comparative denudation on the east. Mr. Easton then went into the plans with the inspector, and said that he considered if groynes were placed 150 ft. apart there would be a natural accretion of shingle which would practically form an apron protecting the foundation of the wall. There was a very long stretch of solid chalk of very even slope extending away into the sea at this point, which would to a great extent prevent the cutting-out action at the base of the wall. With regard to the Parliamentary estimate, there were three or four reasons which had changed it considerably. It was at first thought that they would have got convict labour for portion of the work, but this had been abandoned. Then the number of the groynes had been doubled in order to strengthen the wall. He originally estimated for twenty-five groynes to cost 5,000*l.* but now fifty were to be provided. The estimate for building the wall and the backing work had been increased from 97,000*l.* to 164,000*l.* Of course, that estimate entirely depended upon what the Government were going to do with respect to the Naval Works Bill. The borrowing powers of the Company in the remodelled Bill would be about 200,000*l.* Evidence was also given as to the destruction of a road and houses under the cliff in consequence of the encroachment of the sea. Experts were also called as to the probable effect of the proposed works on navigation, and all agreed that no danger could result from them.

THE FAILSWORTH SEWAGE PURIFICATION WORKS.

THE following account of these works (briefly mentioned in our columns last week) has been forwarded to us by Messrs. Lomax & Lomax, the engineers to the scheme. As it is of considerable interest we give it in full as sent to us; it must be understood, of course, that the responsibility of the statements as to the success of the work rests with the engineers:—

"The formal opening of the Failsworth sewage outfall works took place on Thursday, April 2. The ceremony was attended by a large company, and was presided over by Mr. Councillor Wild, J.P., Chairman of the District Council. Mr. Councillor Dunkerley, Chairman of the Sewage Committee, declared the works open. Mr. C. J. Lomax, A.M.Inst.C.E. (Messrs. Lomax & Lomax, Manchester and Bolton) is the engineer who has carried out the scheme. Messrs. Freeman, of Hollinwood, are the contractors, the process adopted being the 'International.'

The outfall purification works which have been constructed embody all the latest improvements in sewage treatment, and are on a scale which will ensure the continual and successful treatment of the sewage. The sewage enters the outfall works at an elevation of 12 ft. above the water level in the tanks, advantage being taken of the fall by utilising the water power for chemical mixing purposes and other minor work. Sufficient power is also obtained to work an air-compressing engine, which will supply the necessary power to a ram for elevating the sewage from the few houses situate somewhere about 35 ft. below the water level in the tanks. The sewage passes from the mixing house into two detritus tanks. The action of the precipitant 'ferozone,' which has been previously mixed with the sewage, shows itself to a striking degree in these tanks. The sewage passes out by troughs into six upward flow tanks, and the degree of clarification that takes place in these tanks is remarkable. From the tanks the effluent passes on to 6-in. polarite filter beds. The filter beds adopted are on an entirely new system, the patent rights being the property of the International Water and Sewage Purification Company, Limited. In the ordinary method of filtration the beds are in the first instance slowly filled up until about 1 ft. of water stands upon the surface. The process of filtration then commences. The water in passing through the bed is exposed to the purifying action of the oxygen contained in the atmosphere, but the available oxygen in the bed is rapidly exhausted, and so long as a head of water is kept upon the surface of the bed it is physically impossible for the air to penetrate into the interstices of the filtering material. To overcome this difficulty the International Company are now putting down a new process, Failsworth being the second successful installation. The filter beds, being six in number, are grouped three on each side, with a central inlet channel dividing them. This inlet channel is of sufficient capacity to cover the filter beds 3 in. in depth with water.

Each bed is supplied by two automatic flushing syphons, which discharge the water from the inlet channel in the space of about thirty seconds over the entire area of the filter; the water then sinks through the bed and disappears in about five minutes. The flow of water to the inlet channels is so regulated that it takes exactly twenty minutes to fill and discharge, therefore the filter-bed is entirely empty and exposed to the atmosphere for fifteen minutes out of every twenty. Three inches of water spread over the surface every twenty minutes is equal to 1,000 gallons to the square yard in twenty-four hours, and this is the speed at which the Failsworth filter-beds are now working successfully. It will be clear to all that this intermittent method of filtration must be immesurably superior to the old method of continuous filtration, because the bed is allowed fifteen minutes out of every twenty for aeration. By the intermittent method of filtration purification is obtained not only by direct oxigination but also by the organisms that have been proved to rapidly increase in the beds. The effluent as it leaves the filter-beds is clear and sparkling, devoid of froth on shaking, and is entirely free from odour. The area of the filter-beds is 960 square yards. One singular feature in the intermittent filtration is, that whilst this large volume of water is being rapidly flushed upon the bed not one particle of sand is disturbed from its place."

BRITISH ASSOCIATION OF WATER-WORKS ENGINEERS.

THE establishment meeting of a new, important, and representative body, with the above title, took place on the 11th inst., at the Westminster Palace Hotel, under the presidency of Mr. D. M. F. Gaskin, M.Inst.C.E., Nottingham. Representatives were present from all parts of the country, including London, Birmingham, Birkenhead, Widnes, Oldham, Batley, South Staffordshire, Devonshire, Kent, Suffolk, Yorkshire, and Somersetshire. The Chairman congratulated the meeting upon its representative character, and submitted a draft copy of constitution and rules for the management of the Association, which had been drawn up by a provisional committee. It was pointed out that the object of the Association would be to promote and facilitate the interchange of information, ideas, and practice amongst its members on all matters pertaining to waterworks undertakings, and the mutual advantage of water authorities and consumers; to invite from the members and others communications, written or oral, relating to waterworks engineering, management, and finance, and to receive, hear, and discuss such communications at meetings of the Association or elsewhere; to invite the exhibition of and to exhibit at meetings of the Association or elsewhere any new or approved machinery, apparatus, plans, drawings, or models calculated to advance the knowledge of waterworks engineering and management; to assist the Legislature, public bodies, and others in ascertaining the views of persons engaged or interested in waterworks undertakings; to originate and promote improvements in the law, and to support or oppose alterations therein, in all matters relating to waterworks; to watch over, promote, and protect the mutual interests of its members; and to provide facilities for promoting and maintaining, professionally and socially, a spirit of fraternity amongst its members. One of the objects of the Association, and by no means the least important, will be to appoint examiners and to hold examinations. The Association is to consist of three classes—members, associates, and hon. members; and the council will have power to establish a graduate class for pupils of waterworks engineers, and to elect candidates upon such conditions as they may deem advisable. Hon. members will be persons of distinguished scientific attainments whose knowledge on matters relating to water and water supply recommend them to the council. They are to be nominated and elected by the council, and are not to exceed twelve in number. The affairs of the Association are to be managed by a council of members, consisting of a president, two vice-presidents, ten members, and an honorary secretary and treasurer; and annual and general meetings are to be held at such times and places as the Council may consider desirable. The rules having been agreed to, with slight verbal alterations, Mr. Gaskin was elected the first President, Messrs. H. A. Hill, M. Inst. C.E. (South Staffordshire Waterworks Company), and W. Matthews, M. Inst. C.E. (Southampton), vice-presidents, and Mr. W. G. Pierce (Richmond) hon. secretary and treasurer. The council of ten, elected by ballot, are Messrs. Priestly (Cardiff), Woodward (Wolverhampton), Roberts (Ipswich), Watts (Oldham), Jones (Chesterfield), Richardson (Birkenhead), Leggett (London), Terry (Sheffield), Sandeman (Plymouth), and Bowker (Mid Kent). It was resolved that the first annual gathering of the Association, which will take place at the end of July or the beginning of August, should be held in Nottingham. The meeting will occupy three or four days, and will cover presidential address, and reading of papers, excursions, and visits to and examination of works. At a subsequent meeting of the Council, Mr. W. H. Brothers, of Birmingham, was appointed general secretary.

The offices of the Association are at Palace Chambers, 9, Bridge-street, Westminster.

NEW BAKERY, LANCASTER.

THE Bakery illustrated in this issue was completed in December last, and has been built to replace some iron gas-ovens which were worn out and proved exceedingly expensive to work on account of the large consumption of gas.

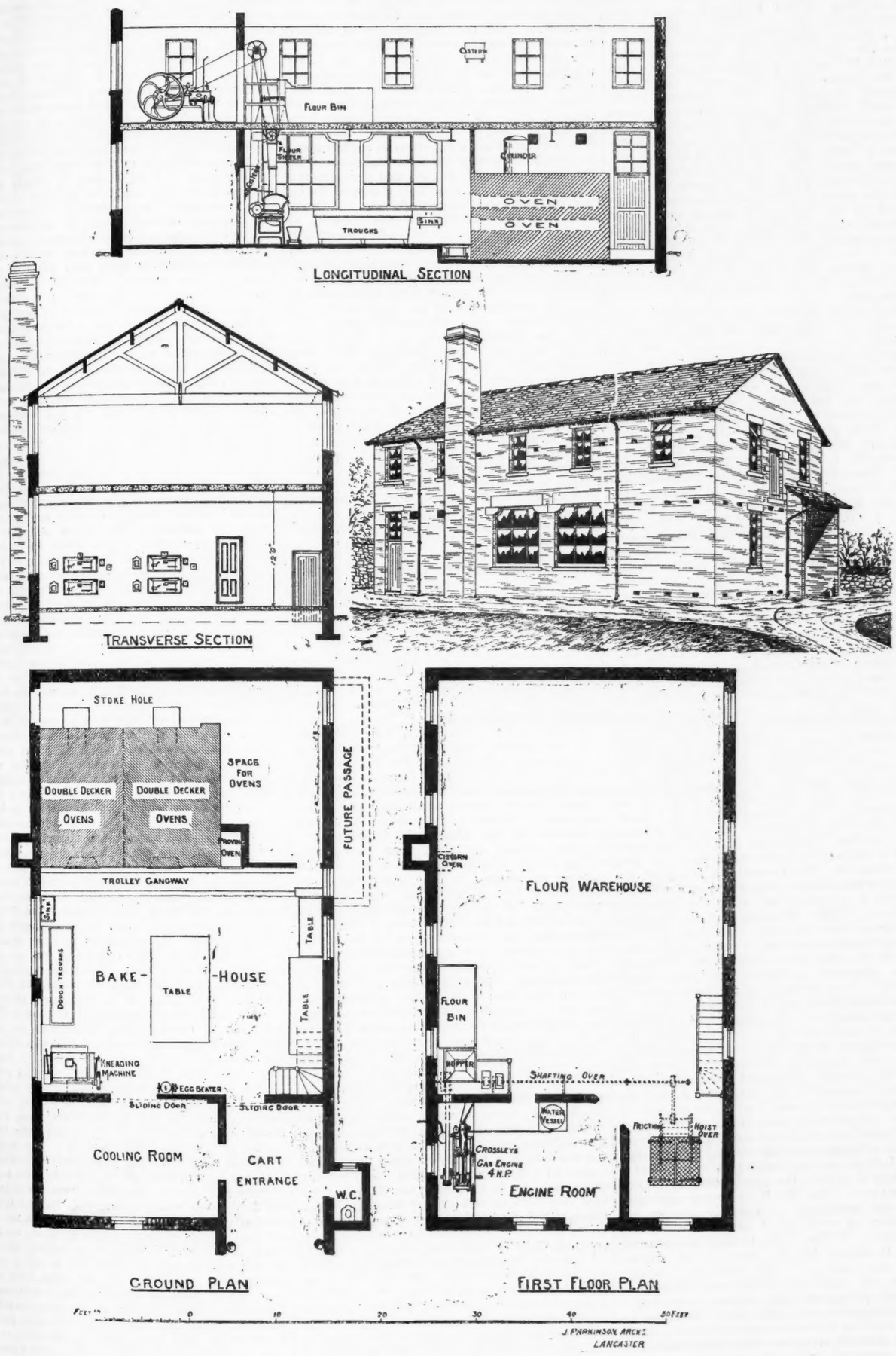
The plans and sections explain themselves, and it need only be added that the machinery and fittings are from measurements taken on the spot.

The floors have a finishing coat one inch thick of one cement to one Coniston white sand. The walls of the bake-house and cooling-room are lined with white glazed bricks, and the ceilings are finished with Robinson's cement; the upper floor has a splayed cement plinth to facilitate sweeping.

The ovens are after the Lancaster pattern and were built by the inventor, Mr. Richard Comthwaite, who also executed the walls of the building, which are of brick. The consumption of coke for the four ovens is one ton per week; hot water is obtained by means of a small copper boiler placed within one of the furnaces and connected with copper circulating pipes to the cylinder.

The machinery was supplied and fixed by Messrs. W. F. Mason, Limited; and the remaining contractors were Mr. Joe Johnson, concrete and drainage; Mr. W. Richardson, joinery; Mr. T. Liver, slating; Messrs. Calvert & Heald, plumbing; and Messrs. Meadowcroft & Sons, painting. The architect was Mr. J. Parkinson.

DAMAGE TO A CHURCH, LYDNEY, GLOUCESTERSHIRE.—During the gale on Sunday afternoon last 15 ft. of the spire of St. Mary's Parish Church, Lydney, Gloucestershire, was brought down, wrecking as it did so a part of the south aisle of the church. The spire was under repair, and a scaffolding which had been erected came down, together with a quantity of masonry.



NEW BAKERY, LANCASTER.

MR. J. PARKINSON, ARCHITECT.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held on the 8th inst., the President, Dr. R. Rowand Anderson, in the chair. After the usual preliminary business, a paper entitled "Notes on a Tour to Rome" was read by Mr. James Clark, President of the Master Painters' Association. The lecturer briefly sketched the chief architectural features of places on the route. He described at length various artistic sights of Rome, and special attention was given to architectural details, to pictures and statues, and especially to mural decorations, of which the lecturer had made a special study. A complete series of lime-light photographic views added to the interest of the lecture.——The members of the Association left the Waverley Station on the 11th inst. for Dunfermline, on a visit to the Abbey and Palace, and also Pitreavie House, some miles distant. Mr. David MacGibbon, F.S.A. (Scotland), acted as leader of the party.

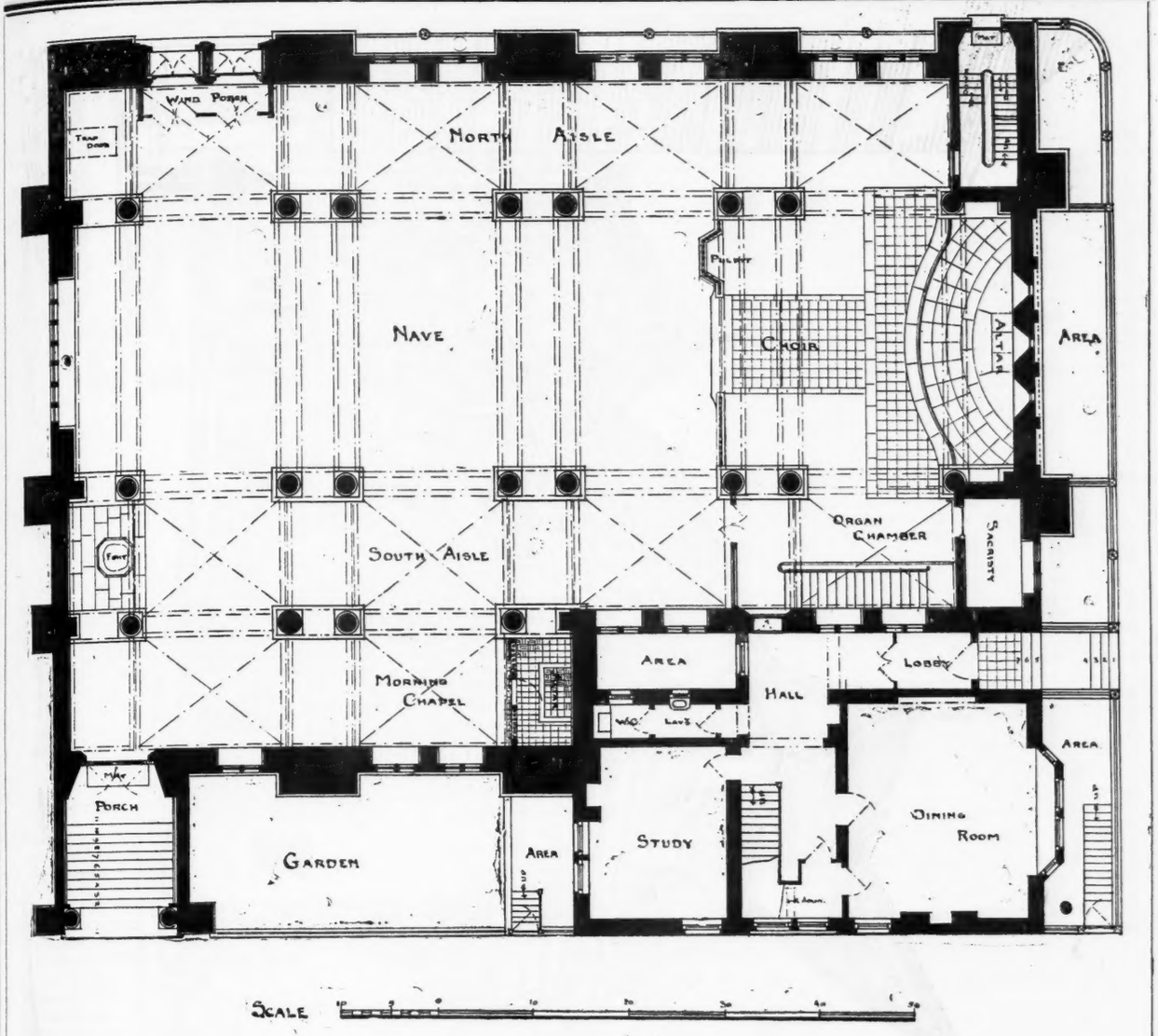
SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting was held on Tuesday night at the School of Art, Arundel-street, the President, Mr. C. Hadfield, F.R.I.B.A., in the chair. Mr. C. J. Innocent (Hon. Sec.) read the annual report, which showed that the Society had increased in numerical strength, having a total of 103, against eighty-five at the end of the previous year. The following new members had been admitted as students:—Messrs. W. J. Beall, R. B. Brook Greaves, and H. C. Brameld; and the following students had been promoted to the class of Associates:—Messrs. F. W. Brook Greaves, H. Dawson, J. C. A. Teather, and F. Wilson. The alteration in the rules made during the previous year in order to provide for the admission of honorary members and lay members had resulted in the election of the following during the last twelve months as lay members:—Messrs. W. T. Chappell, J. T. Cook, A. H. Holland, A. Jackson (since dead), C. F. Longden, W. Parkin, H. W. Pawson, G. Senior, H. Thomas, J. Walsh, T. H. Waterhouse, J.P., G. Welch, and J. Wortley; and invitations of the Council to become honorary members had been accepted by the Duke of Norfolk, the Duke of Devonshire, the Earl of Wharncliffe, and Mr. J. D. Leader, F.S.A. The library had been increased by the donation of a good many valuable publications. Lectures had been given during the session by Mr. Paul Waterhouse on "The Brotherhood of Architects;" Dr. Sorby (hon. member) on "Norman Architecture;" Mr. Percy Fitzgerald on "The Adam Architecture;" Mr. Thomas Winder on "Local Half Timbered Buildings;" Mr. Hugh Stannus on "Axiality." The attendances had been larger than in former years, and the interest had been well sustained. The Council had forwarded the following resolution in response to an application to assist a movement respecting some proposed changes:—"That the Council of the Sheffield Society of Architects and Surveyors would be willing to consider any tangible scheme for rendering the R.I.B.A. more useful to the profession, more influential generally, and more representative of the interests of country architects." On an inquiry from the R.I.B.A. (a special general meeting having been adjourned in order to get the views of allied societies) it was replied that:—"The Council of the Sheffield Society of Architects and Surveyors carefully considered the question of a form of contract at several meetings during the year 1891, and ultimately decided not to recommend the members of the Society to adopt any particular form, and the members of the Council present at this meeting do not know of any sufficient reason for altering that decision, especially as the experience of the architects of Sheffield is against the appointment of outside arbitrators." The R.I.B.A. having appointed a special committee to consider the present condition of architectural competitions, it was resolved:—"That this Council recommends that it should be the duty of an assessor in a competition to put aside such designs as do not fulfil the stated requirements on material points, and that to give prominence to such designs in a way that makes an excuse for their adoption by the promoters of the competition is an injustice to those other competitors who have complied with the instructions, and a violation of the protection which architects ought to obtain by the employment of a professional assessor; and that all requirements which are not distinctly stated to be optional should be treated as imperative." A movement had been commenced by three members of the society for the publication of "The Sheffield and District Architectural Sketch Book." The Council of the Society, while not taking any pecuniary responsibility in the matter, cordially commended it to all who were interested in local architecture; and the President of the Society had consented to co-operate with the promoters. The sketching class, conducted by Mr. J. R. Wigfull, made six visits during the summer, taking Worksop Priory Church, Dronfield Church, Bolsover Castle, Derwent Hall, and Darnall Hall. Of the thirteen students who joined the class, five attended only once, four attended only twice, while only one student made the six attendances on the appointed days. The President's prize of 3*l.* 3s., and the Society's prize of 1*l.* 11s. 6d., were only competed for by two students, and their work was so nearly equal that the services of Mr. Austin, of Lancaster, were obtained to make the award, and after he had carefully examined the work, for which the thanks of the Council were tendered to him, the first prize was given to Mr. L. D. Hemsoll, and the second prize (augmented to 2*l.* 2s. in consideration of the excellent work) to Mr. F. Wilson. The architectural history class, under the guidance of Mr. J. R. Wigfull, had taken "Window Tracery during the Fourteenth and Fifteenth Centuries," and "Nave Arcades, from the Eleventh to the Fifteenth Centuries." In the designing class, which had been conducted, as in previous years, by Mr. E. M. Gibbs, the subjects treated had been: 1, entrance gates to a nobleman's park; 2, a picture gallery; 3, artisans' dwellings in town and country; 4, a village school; 5, a village church; and 6, the interior treatment of a dining room. It was to be regretted that the classes were not successful during the past year, and the Council thought that the entire arrangement of the classes should be reconsidered.

THE SANITARY INSTITUTE:

"THE FACTORIES AND WORKSHOPS ACTS."

DR. J. F. J. SYKES, Medical Officer of Health for St. Pancras, read a paper on "The Factory and Workshops Acts, and the Powers and Duties of Sanitary Authorities with regard to Workshops," at the Sanitary Institute, Margaret-street, W., on Wednesday evening.

In the course of his paper, Dr. Sykes said that the Factory and Workshops Acts were now administrated partly by the Home Office, through H.M. Chief and District Inspectors of Factories, and partly by Sanitary Authorities, through Medical Officers of Health and Sanitary Inspectors. Factories fell entirely under the supervision of the former, and workshops, as to their sanitary condition, under the control of the latter. There were also a considerable number of sections in the Acts that were impersonal, and under which legal proceedings might be taken by persons aggrieved. After mentioning what constituted a factory and enumerating the different kinds of workshops, Dr. Sykes passed to a brief consideration of how a sanitary authority was to become cognisant of the workshops within its district. Proceeding, he said that when they reached nuisances, they had an apt illustration of the involved nature of the legislation they were dealing with. The net result of the many cross references was that all extra-metropolitan workshops and work places were relegated by the Factory and Workshops Act, 1891, to Section 91 of the Public Health Act of 1875, and similarly Section 2 of the Public Health London Act, 1891, had now within its pale all metropolitan workshops and workplaces. Respecting those nuisances special to workplaces, it was the duty of a sanitary authority to see, with regard to every workshop within its district—(1) that it was kept in a cleanly state; (2) that it was kept free from effluvia arising from any drain, closet, urinal, &c.; (3) that it was ventilated in such a manner as to render harmless any gases, vapours, dust, or other impurities generated in the course of the work carried on therein; (4) that it was free from overcrowding—that was, that at least 250 cubic feet of space per head were provided during ordinary working hours, and 400 cubic feet during overtime; (5) that the prescribed notice specifying the number of persons who might be employed in each room was duly affixed at the entrance to the workshop, or that the fact was otherwise made known; (6) that a reasonable temperature was maintained in each workroom; (7) that it was limewashed, cleansed, or purified when necessary for health as certified by an officer of the Sanitary Authority—bakehouses being excepted and otherwise provided for; (8) that it was provided with sufficient and suitable sanitary conveniences for each sex; (9) that note was made of the employment of protected persons, in order that the Factory Inspector might be informed; and (10) that the list of outworkers was inspected. One or two of these points required a little further explanation. It was scarcely necessary to say that full powers of entry were provided for the officers of Sanitary Authorities, in order to execute their duties under these Acts. It would be noted that by Section 33 of the Act of 1895 power was given to require mechanical means of ventilation to be employed where necessary, and in such dusty occupations as dirty-paper and rag-sorting in closely confined quarters, this might be requisite in some cases; also where large quantities of gas were burnt during ordinary work or in overtime, although the extra provision of space—150 cubic feet per head during overtime work—was probably intended to meet this, allowing one burner for two persons. But the exercise of this power, even in the case of workshops, was given to the factory inspector by Sec. 36 of the Act of 1878, and not to the Sanitary Authority. As to what was a reasonable temperature, the requirements of the particular process of work must be taken into consideration. Sufficient sanitary convenience is usually held to be satisfied by the provision of one water-closet for every twenty persons of each sex. It was the duty of Sanitary Authorities also to see that this provision was made in factories as well as in workshops, although it did not appear that any special power of entry into factories was given for this purpose. Having alluded to the proceedings which should be taken in the case of any infringement of the law relating to public health in a factory or workshop, Dr. Sykes said that in addition to the ordinary requirements for a workshop already enumerated, it was also the duty of a sanitary authority, with regard to every bakehouse within its district, to see:—(1) that the inside walls, ceilings, &c., were (*a*) either painted or varnished every seven years and washed every six months, or were (*b*) limewashed every six months; (2) that a sleeping place was effectually separated from any bakehouse in the same building, and was lighted and ventilated by an external window at least 9 ft. square, one-half being made to open; (3) that a bakehouse cistern was separate and distinct from any water-closet cistern; (4) that any water-closet, earth-closet, privy, or ashpit was cut off from direct communication with a bakehouse; (5) that no drain or pipe for carrying off fœcal or sewage matter had an opening in the bakehouse; (6) that no bakehouse was in such a state as to be, on sanitary grounds, unfit for use as a bakehouse; and (7) that no underground bakehouse was newly brought into use. The last three points were open to considerable limits in definition. Openings for carrying off liquid refuse or waste waters which were not actually fœcal matters, always communicated directly with drains carrying such matters, and liquid refuse was certainly sewage matter. It required to be more clearly stated whether any drain opening was at all allowable in a bakehouse. The sanitary grounds on which a bakehouse might be considered unfit for use were often of a structural nature, difficult and often impossible to completely overcome in many existing bakehouses, due to their underground construction. Although palliative measures could only be applied to such bakehouses now in use, the Act of 1895 prevented disused underground bakehouses being brought into use again, and new ones being constructed. But the law did not define what was meant by an underground bakehouse, whether wholly or partially underground. The most important point seemed to have been overlooked, as it had been overlooked in Building Acts and elsewhere. It was not a question so much whether the bakehouse was underground, but whether attached to the building there was or was not a sufficient amount of open space for light, air, ventilation, and drainage. A bakehouse entirely above ground, without such provision, was as bad as an underground bakehouse, or any other kind of workshop or dwelling under similar conditions. The sanitary provisions, the affixing of notices and abstracts, notice of occupation, and other provisions of the Acts, now applied to laundries, except to laundries of certain public institutions, domestic laundries, and laundries where not more than two non-residents are employed. In a laundry, in addition to the necessary points applicable to all workshops, special attention required to be directed to prevent nuisances from excessive heat in ironing-rooms, and from accumulation and condensation of steam



St. Anselm's Church and Vicarage, Davies-street. Plan.

in washhouses, from noxious fumes of gas, irons, and of stoves for heating irons, and from bad flooring and draining of the surface. By Section 22 (2) of the Act of 1895, in laundries which were factories, a fan or other proper appliance was compulsory in every ironing-room to regulate the temperature, and in every washhouse to carry away the steam, but these and other compulsory powers in this section were not given to Sanitary Authorities for the control of laundries which were workshops. For the purposes of proper record, it was necessary for Sanitary Authorities to keep registers (*a*) of workshops generally, (*b*) of bakehouses, and (*c*) of laundries. In order to complete these registers, the systematic inspection of all workshops within a district was also necessary. For this purpose special sanitary inspectors had been appointed in Islington (2), Kensington (2), St. Pancras (2), Whitechapel (2), Birkenhead (1), Bradford (1), Brighton (1), Bristol (1), Hull (1), Leeds (1), Liverpool (2), Manchester (6), Nottingham (2), Portsmouth (2), and Salford (1). Of these inspectors some were women—in Islington (1), Kensington (1), St. Pancras (1), Manchester (6), Nottingham (1), Brighton (1). Dr. Sykes having touched upon various points affecting the relationship of the Sanitary Authority to the Inspector of Factories, said that in concluding, as in commencing, it was impossible to refrain from expressing the hope that the complications and cross references of factory and workshop legislation might, at no distant date, be reduced to a simpler and less complex form by re-codification. It was, at least, cheering to see that the promise of the future appeared now to be in the direction of the more adequate recognition of sanitary knowledge in the supervision of factories and workshops.

Dr. Corfield, Mr. Mackie, Dr. Parkes, Dr. Kenwood, and Surgeon-Major Pringle took part in the subsequent discussion and a hearty vote of thanks was accorded to Mr. Sykes for his paper. Sir Francis Sharp Powell, Bart., M.P., presided.

Illustrations.

WEST FRONTS, ANGERS AND DIJON.

THE illustrations of the west fronts of these two French cathedrals are reproduced from a portfolio of photographs issued under the direction of the French "Commission des Monuments Historiques." They are introduced here in illustration of the comments on characteristics of French Gothic in the first article of this issue, to which we may refer the reader.

ST. ANSELM'S CHURCH AND VICARAGE, DAVIES-STREET, OXFORD-STREET.

THESE buildings have been erected under a private Act of Parliament, with money realised by the sale of Hanover Chapel, the portico of which forms such a prominent feature on the west side of Regent-street, near Oxford Circus.

The site for the buildings has been given by the Duke of Westminster.

An effort has been made to overcome the difficulty of London dirt in the interior of the building and also to avoid introducing features in the design which call up remembrances of ancient buildings and which must be to the detriment of any modern building, as our present conditions of building render competition with such buildings impossible.

The materials used for the exterior of the buildings are Portland stone for the worked parts, the walling being of stock bricks, with red brick quoins.

The roofs are covered with red hand-made tiles, the flat gutters being asphalted, the eaves, gutters, and downspouts being of cast lead.

The stone for the interior is blue Robin Hood, which has been left from the tool, and waxed, so that it can be washed without harm.

The plaster on the walls has been put on in one coat, a trowel only being used, and the whole whitened.

A dado, elbow high, has been put all round the interior of the church. This is formed of glass tiles made by Messrs. Powell, of Whitefriars.

The windows, including the three small east windows, are glazed with Prior's glass by Messrs. Britten & Gilson, of Union-street, Borough.

The whole of the church has been paved with pitch-pine stained and waxed blocks, with the exception of the chancel, which has steps and paving of Irish black, Irish green, and Pavonezza marble. The screen wall of the chancel is also of Irish green marble, with a gun-metal railing on the top.

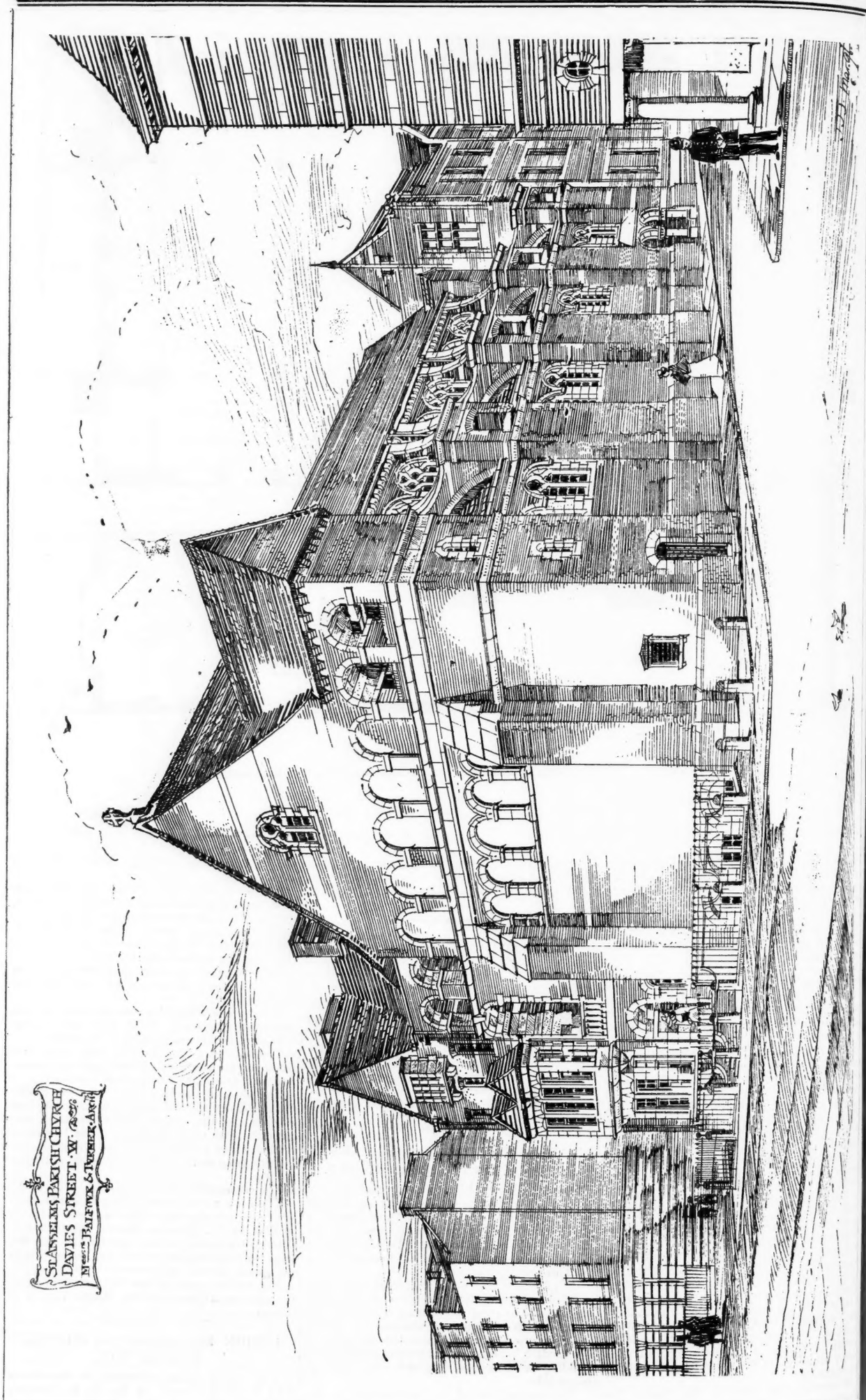
The communion-rail is all of brass.

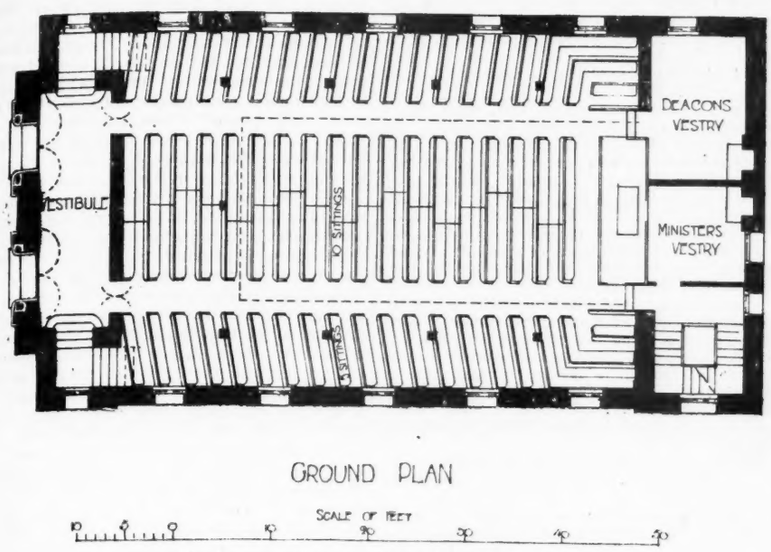
There is a carved screen hiding the approach to the vestry and vicarage, which has been executed in teak by Mr. Lawrence Turner, who has also done all the carving of the capitals and also the large symbolical figures of the four evangelists in the apse at the east end.

The builders were Messrs. W. Holt & Sons, of Croydon; and the architects, Messrs. Balfour & Turner.

DESIGN FOR WESLEYAN CHAPEL, BLAINA, MON.

THIS was a design submitted in competition for a Wesleyan Chapel, by Mr. W. L. Griffiths, of Newport, Mon.


ST ANSELM'S PARISH CHURCH
DAVIES STREET W
MESSRS BAILEY WOOD & PEDDER ARCHTS



GROUND PLAN

Design for Wesleyan Chapel, Blaina. Plan.

The object in the design was to give something more original and picturesque than the usual type of chapel in the district; an attempt in which the architect may be said to have succeeded very well, as the Royal Academy recognised by hanging the drawing at their last exhibition. It is a pity that the attempt did not meet with recognition at the hands of the Competition Committee, considering what is the average architectural form of a Welsh Wesleyan Chapel.

WINDOW, ST. LUKE'S HOSPITAL, NEW YORK.

THIS design for the east window of the chapel of St. Luke's Hospital represents "Christ the Consoler" inviting those who labour and are heavy laden to bring their troubles to Him. The groups below represent various types. In front, on the extreme right, a blind man gropes his way towards the throne. Above him are a lame man on crutches, and one who appears to be well-to-do but feels the weakness of old age coming upon him. Seated near the blind man is a girl sick with a heart complaint, and near her reclines another, thinly clad in worn out garments.

Above, on the same side, a father and mother bring their dying child.

On the other side, on the extreme left, stands a penitent sinner, and near him is a starving girl with an empty basket. Next above her is an old working man, worn with years of ceaseless ill-paid toil, and below him a prisoner of war whose chains are breaking. Near to the throne is a sorrowing Magdalen, prostrate at the feet of her Saviour. Behind her, a widow, and, further back, a youth who may be mourning the loss of his betrothed. Near these are members of some of the oppressed races of the earth.

Surrounding the throne are angels as ministering spirits, and, prominent among these, as supporters on either side, are Gabriel and Michael—the former as the bringer of good, telling of "Immanuel, God with us," and the other, as the vanquisher of the evil one, is sent to answer the prayer, "Deliver us from evil."

Nearest to Christ, and clinging to Him, is a little child.

In the circles filling the arch above the centre subject are the seven acts of mercy, and in the two side lights are nurses tending a sick woman, and a priest administering the sacrament to a dying man.

H. HOLIDAY.

ENGINEERING SOCIETIES.

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—At the meeting of this Society on the 9th inst., a paper was read by Mr. A. Hanssen, C.E., on "The Commercial Efficiency of Steam Boilers." This was an exceedingly interesting paper, the author having been at considerable trouble to collect and tabulate, not only the cost of a number of various classes of boilers, but the cost of their settings, flues, and chimneys; and, having ascertained their capital value and their average life, he compared the sums that it was necessary to set apart annually to recoup the owners for the capital originally invested in them at the termination of their average lives. The question of the use or otherwise of economisers, to be used in connexion with boilers for the raising of steam, was also entered into, and the discussion that took place after the reading of the paper was directed very largely to this point. The President (Mr. S. à Court) was in the chair.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The twenty-first voluntary pass Examination of candidates for the offices of Municipal Engineers and Surveyors to District Councils, carried out by this Association, was held at the Institution of Civil Engineers on Friday and Saturday, the 10th and 11th inst. Twenty-seven candidates entered, and twenty-three presented themselves for examination, the written portion of which was taken on the first day. The greater portion of the second day was occupied with the *viva voce* portion of the examination. The examiners were:—I. Engineering as applied to municipal work, Mr. W. Santo Crimp, M.Inst.C.E.; II. Building Construction, Mr. J. Lemon, M.Inst.C.E., Past President and Superintending Examiner; III. Sanitary Science, Mr. J. Lobley, M.Inst.C.E., Past President; IV. Public Health Law, Mr. J. T. Eayrs, M.Inst.C.E., Past President. The next examination will be held at Liverpool in October next.

LIVERPOOL ENGINEERING SOCIETY.—The members of this society, on the invitation of Messrs. Holme & King, the contractors for the Breeze Hill reservoir works, now being constructed and approaching completion for the Liverpool Corporation, visited them on the 11th inst. This reservoir is being constructed principally to supply the northern parts of Bootle and Walton with water, and will contain a total of a little over 6,000,000 gallons. After viewing the works the company were entertained to luncheon.

COMPETITIONS.

STATUE OF FLORA MACDONALD, INVERNESS.—The Inverness Town Council met recently, and along with Colonel Berkeley, one of the trustees of the late Captain Henderson Macdonald, inspected the fifteen competing models for the memorial to Flora Macdonald, which have been on exhibition for over three months. After a careful examination of the models, Colonel Berkeley said he would be satisfied if any one of the five having the following mottoes was chosen:—"Pibroch," "Finnuella," "Air Faire," "Semper Fidelis," and "Experto Crede." The voting slips were then examined, with the following result:—"Air Faire," 14; "Finnuella," 2; "Experto Crede," 1. The selected model entitled "Air Faire" was sent in by Mr. Andrew Davidson, sculptor, Inverness.

"SAXON HALL," PALACE COURT, KENSINGTON.—This more than usually sumptuous London house is to be sold by auction next month, by order of the trustees of the late Hon. T. I. Fellows. The architectural style is not the best, but from the illustrated programme of the sale the house evidently contains some very fine rooms decorated in good taste, and in regard to the completeness and costliness of all the finishing and fittings it appears to be quite exceptional.

Correspondence.

To the Editor of THE BUILDER.

"WORKS OF ARCHITECTURE IN ITALY."

SIR,—I have not till now seen the notice of the Cyclopædia of Works of Architecture in Italy, etc., in the *Builder* for February 15. Will you kindly allow the editor a few words of explanation?

The article complains that Mr. Penrose's work, "The Principles of Athenian Architecture," is ignored, not even being mentioned in the Bibliography of the Cyclopædia, so that it appears probable that the editor is not even acquainted with it, "a piece of ignorance which seems really astonishing." It would seem astonishing in men who assumed to offer the public an important work on architecture; but Mr. Penrose's "Principles," a book whose significance and deductions reach beyond the range of a mere monograph, is conspicuously cited in the first page of the bibliography. Your critic must have overlooked it.

As to the treatment of English archæologists, the late Mr. Ludlow, who was responsible for the classical part of the work, unhappily cannot explain his position, and I will not assume to suggest his reply; but I may explain that, for reasons which seemed valid, the policy of the book has not been to emphasize the work of individual writers and explorers. It will be seen, for instance, that in describing the temple at Assos, whose exploration was made by Americans under direction of Mr. Clarke, his work is not recorded, and that the names of the Germans who excavated Olympia are likewise unmentioned, the indications given in the bibliography being thought to be sufficient, and being meant to be even-handed.

There is reason for your criticism of the scope of the book, judged by its title. But it is just to the publishers to say that this volume is only a part of their scheme, of which it was not thought wise to promise the continuation till the acceptance of this was assured. The countries which you mention as naturally connected with Italy and the Levant were reserved for a second volume, and others were to follow. The title of gazetteer would, I think, have fitted better; but the wish to make this work part and parcel of a still larger series, of which five volumes are already published, ruled in the choice of title. It does not pretend, by the way, to be "Another Cyclopædia of Architecture," but only of works of architecture, which is a much smaller thing. And surely the "whole world of mediæval architecture," whose absence you noted, is not omitted; for the architecture of Italy from the time of St. Ambrogio of Milan to that of the Cathedral of Siena is a considerable part of that world.

Let me finally express my gratification at the general fair-mindedness of your criticism, and my sense of the value of its approval.

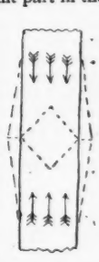
W. P. P. LONGFELLOW.

Milan, April 11, 1896.

*** We fear Mr. Longfellow's explanation as to Mr. Penrose's book rather confirms our impression that he was not acquainted with it beyond its title; for it is named under the heading "General Treatises," whereas those who were well acquainted with the book would naturally have looked for it, as we did, under the heading "Special Works and Monographs," which is what it really is, in spite of its title.—ED.

THE STABILITY OF BRICKWORK COLUMNS.

SIR,—Mr. Percival's letter in your issue of April 11 has undoubtedly thrown a great deal of light upon the nature of strains in piers, and I quite agree with him that cohesion plays a most important part in their stability, but I think that his illustration of a bundle of fibres bound at either end, and weighted on the top, is hardly a parallel case to an ordinary brick pier used in building, for this reason—that if the fibres are firmly bound at either end, and left free at their centres, the natural result is that they will immediately bulge outwards (perhaps only very slightly) towards the centre of the bundle before any load at all is brought to bear upon them, and a very slight knowledge of mechanics will show us that any load placed on such a structure must at once tend to decrease the angle of deflection at the centre, thereby forcing the fibres still more in an outward direction. If, on the other hand, the fibres could have an inward camber the result must be exactly opposite, and the fibres would all tend to press in an inward direction at the centre of the bundle when loaded.



If the fibres were perfectly straight and the material absolutely uniform throughout their length and the weight uniformly distributed on to each fibre, there is no reason why they should bend in either direction until shearing commences, then, of course, the height is diminished and the fibres are

forced outwards by the reaction of the inside particles in compression at the point of shearing.

It seems to me that the principle of the inclined plane may have a good deal to do with the conditions of stability, and if we consider two conic-shaped portions of the pier, base to base, forming virtually a pair of wedges against which the upper and lower portions of the pier are being forced—the former by the load and the latter by the reaction—the natural result is that the pier spreads until the cones are themselves finally crushed.

In this case however we again come back to Mr. Percival's conclusion, that the strength of a pillar is dependent upon its cohesion, and that forces tensile in character play a most important part long before the mere crushing of particles is concerned.

C. PHILLIPS SANDERS.

SIR,—Will you allow me to submit a method for building 18 in. by 18 in. brick piers as regards bonds?

Bearing in mind the tests have been confined to the square piers, and also the fact that "the first tendency to separation showed, not in the joints, but in cracks in the centre of some of the bricks," it seemed to me the strongest possible combination of bricks to resist the "great tension strains brought on the centre bricks of the pier under pressure" would be to bring the purpose-made king-closer to the face as shown by sketch. Fig. 1 is plan of every course; Fig. 2 is a perspective sketch of the pier.

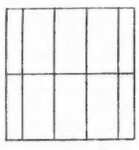


Fig 1.

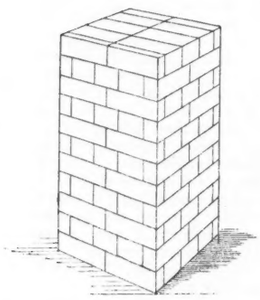


Fig 2.

Speaking as a bricklayer, I should be sorry to see bricks made wider than at present.

A man can grasp and properly lay an ordinary brick with ease, but not a brick 6¾ in. or 9 in. in width. This would require the use of both hands, and the probability is the beds would not be solid, nor the bricks true in shape when burnt.

R. RAMM, *Clerk of Works.*

Walton-on-Thames, April 13, 1896.

*** We are quite willing to give Mr. Ramm's diagram, but we cannot say we approve of the idea of putting the weakest form of bricks, and the one most likely to yield to shearing, on the exterior of the pier. As to 9 in. square bricks, we have already condemned them, but we hardly think that a 6¾ in. wide brick ought to be too heavy to work, for a portion of the brickwork, along with the ordinary bricks. If, however, the practical bricklayer, who is perhaps the best judge, finds that it is, then we should fall back on the mixture of 6¼ in. long bricks, to which there is no objection as to weight, and recommend our Fig. 3 pier in the last issue, especially with the modification suggested in the text, as a stronger one than the pier as built for the tests. The great point is that the line of weak closers does not go *through*, but is cross-bonded by stronger bricks at the ends.—ED.

RE PLUMBERS' REGISTRATION BILL.

SIR,—In reply to "Old Plumber," I would remind him that we advertised the mass meeting at Kensington both in yours and another architectural journal, and several weekly ordinary newspapers, that anyone wishing to be present could apply and receive, if he was a legitimate plumber, a ticket of admission, and that there was over 2,000 of those tickets circulated; and if, as our friend says, there was not half the 500 (which is an erroneous statement), it was no fault of those who were responsible for the meeting; and therefore I totally deny his assertion when he says it was not a representative one of the trade, for it so happened that the whole hall was strewed with leaflets from those who chose to call themselves the opposition.

"Old Plumber" would have us believe that this meeting was "got up" (is the exact term) "in the first place by one man for his own special glorification."

Sir, I take that as referring to myself, but I am used to such phrases.

I would remind your readers that, years ago, I have been upon the Registration Committee, and that I owe no ill feeling to any one, nor to the Worshipful Company of Plumbers; but what I have for years past, and do at the present moment think to be a complete farce, is the granting of certificates without every one undergoing a proper examination by examiners who are capable of judging and putting varied questions, and not a set lot of questions which has been used from year's end to year's end, and of next to no value.

So far as regards the Bill is concerned, it is the most complete one-sided document (when properly understood) that is possible to be constructed, and is in the opinion of thousands of working men a completely useless affair. Hence the reason why we call upon the House of Commons to reject the Bill, and not through spite against the Plumbers' Company as suggested, or, perhaps, better, erroneously stated by "Old Plumber."

"Old Plumber" has made an assertion implying that the affair was worked upon "ultra-socialistic principles."

I am no Socialist, but, on the opposite, one of the strongest Conservatives in the borough of Kensington; and, to prove this, have been for twenty years a rigid worker on committees and other ways for our late member, Sir Algernon Borthwick, and also for the present one, Lord Warkworth.

So that, taking every portion of "Old Plumber's" letter into consideration, it can only be looked upon as a spiteful and untruthful document.

P. J. DAVIES,

*** The first paragraph of Mr. Davies's letter seems to bear out exactly the statement of "An Old Plumber," that it was not a representative meeting; a number of persons were asked, but would not come. We may also remind Mr. Davies that the resolution which, as we reported, was "agreed to," was declared to be carried without the usual formula of asking for a show of hands of those opposed to it.—ED.

The Student's Column.

CARPENTRY AND JOINERY.—XV.

ORNAMENTAL CARPENTRY.

UP to the present our articles have dealt principally with carpentry as a constructive science, and with comparatively little regard to artistic merit. The student, on referring back, will observe that constructive necessity has initiated and controlled the shapes of the various types, and that in many, if not most cases, the constructions were to have been built in an edifice, and when fixed were not to be visible. In such cases, it is but natural that little care should be expended on the appearance, and, in fact, it would be waste of time and labour to ornament it. Works on carpentry invariably leave out the decorative side of the craft, and, therefore, it has been thought advisable to include in this series an article in which the setting out and construction of some of the most usual types of decorative carpenter's work are explained. We must guard the reader, however, against the idea that we are offering these examples, even the ancient ones, as models of design; they are merely given as illustrations of the type of work which is referred to.

HALF-TIMBER WORK.—In the middle ages, houses formed of timber framing were common, and perhaps usual, in both town and country, and many are the picturesque groups of cottages and town fronts which are rapidly disappearing from our midst. In London the Staple Inn, Holborn, still remains as an admirable example of this type, and should be studied in its detail for the true principles of this type of building, of which it is in every way an admirable example.

The fire of London in 1666 must have been responsible for the loss of a large number of important timber-framed houses. In Chester are an admirable series of such house fronts, many of which have from time to time been illustrated in the *Builder*. Houses on a larger scale are also numerous, especially throughout the counties of Lancashire and Cheshire.

A small illustration of a gable to a house at Hereford is given as an example (fig. 166), showing the curved braces which are inserted as stiffening pieces, and whose design in many cases is elaborate and effective.

Oak should of course be employed, where possible, as solid framing; but where this is impossible, it is often used as a thin facing (1½ in.) to fir posts and rails behind. The general framing of these buildings is composed in modern work of upright posts and rails of timber, 4½ in. by 4½ in., or 6 in. by 6 in., morticed and tenoned into each other, and pinned where necessary with oak pins. Curved braces are inserted not only for strengthening the framing, but also as an aid to the design, as shown in the illustration.

Oak has often been tarred in old houses for the sake of preservation, and presents a very quaint appearance as seen in Lancashire and Cheshire; or the surface may be left its natural face. If pine is used it may be treated similarly or painted. A quaint and picturesque effect is obtained by allowing the floor timbers of the upper story to project, as in the illustration; these are cantilevered over the main face of the framing beneath, and are likewise often aided by curved brackets which support a plate carrying their ends, the face of the wall above being carried up vertically from its outer plate, as in the illustration. The method of constructing the outer walls of these half-timber buildings has to be carefully considered; the spaces between should be filled in with concrete or brickwork, and have an inner face of slag-wool. A plan is given of a method (fig. 167) which has been used in modern buildings, and which has been found successful in keeping as equable a temperature as is possible in buildings of this kind. It will be observed that beside the concrete filling there is an inner compartment of slag-wool.

DORMER WINDOWS form features which aid in producing a picturesque skyline, and are, in many examples, mediæval and modern, very elaborately treated. Being part of the roof, they are almost invariably of timber construction, formed into small gables. They are useful for lighting rooms, entirely or partly in the roof. The skeleton construction of one of these is shewn in a previous article on roofs.

BARGE BOARDS form a necessary termination to a timber roof and are usually employed not only for half-timber houses but also in other houses of a domestic type; though it must be admitted that those of the more "ornamental" class are too often, whether in ancient or modern work, little better, in an architectural sense, than what may be called "gimcrack." Still, there is a desire for them at times, and if made at all they should be well and carefully made. The purlins, ridge and wall plate, project beyond the face of the gable from 1 to 2 ft., and support the rafters. The end rafter is covered with what is known as a barge or verge board, and the tiles or roof-covering project 1 in. to 2 in. beyond its face. Barge boards, if over 11 in. wide, should be framed. In certain cases they are tenoned at the ridge into an upright post called a finial, and are often elaborately treated, as in the exampie from Coventry, fig. 168, in which a portion of the barge board is also shown on each side. An open work barge board is also given, fig. 169, from an old house at Droitwich, and a better-designed example, fig. 170, from a cottage at Worsborough, near Barnsley, in Yorkshire. It shows a rather elaborate specimen of a barge-board carved beam and gable finial. In the walls in old work, the face timbers occupy as much room as the intervening spaces, which gives a look of solidity, sometimes wanting in modern examples. This close spacing should be adopted; it is shown in the present illustration.

TURRETS and features of a like nature are often formed on the summits of roofs, both for use and ornament. They may contain an extract ventilator from one of the rooms below, in which case they are treated so as to form an artistic screen. A turret of this kind often contains a bell. A plan, elevation, and section of a design for one of these is given (figs. 177 and 178), a reference to which will sufficiently show the construction. As a feature of this kind is exposed, it is necessary to be braced sufficiently to enable it to withstand considerable wind pressure, and it must, therefore, be cross-braced in addition. It will be noticed that the rafters to the upper part are framed into a central post, through which a tie-rod passes, receiving the iron weather cock. The upper portion is sufficiently ventilated by means of the small louvres. The central post is held in position by two pieces of stuff passing on each side of it, holding it to two sides of the octagon. The framing to support the bell is indicated. The posts to the octagon are out of 4 in. stuff; that forming the arching is 2 in. thick, tongued into the framing; the shaped truss at the bottom is out of 2½ in. stuff, grooved and tongued into the posts, and held firm by oak pins. The cornice is made up as shown.

Illustrations to Student's Column: Chapter XV.—Ornamental Carpentry.

166. Gable to a house at Hereford.
167. Plan of framing.
168. Finial from Coventry.
169. Barge board from Droitwich.
170. Gable end from Worsborough.
171. Porch from Church of Huddington.
172. Plan of porch.
173. Lychgate.
174. Garden wicket.
175. End elevation of conservatory.
176. Part of plan of conservatory.
177. Turret, with bell.
178. Plan of turret.
179. Dove-cot.
180. Plan of dove-cot.
181. Entrance gate to a drive.
182. Lattice fencing.
183. Lapped paling.
184. Open paling.
185. Chair, French, fourteenth century.

DOVE-COTS are framed up in a similar way. Figs. 179 and 180 shew an example lately erected over some stables, where it was necessary to arrange for a ventilating shaft in the centre. It will be seen that it is of very simple construction, being 4 ft. square over all. The angle posts are 5 in. by 5 in., intermediate posts 4 in. by 4 in., framed at top and bottom into rails pinned with oak pins. The angle posts are carried down and framed with strong rafters 6 in. by 4 in. The pigeon-holes are framed out of 1¼ in. boarding, and the ventilating shaft is also of 1¼ in. rough boarding, ploughed and tongued, and made air-tight with double-hinged and weighted flaps at bottom. The rafters are 4 in. by 3 in., covered by rough boarding, spaces at the top being left for ventilation as indicated. The central post into which the rafters are framed is fitted between two horizontal struts, and the iron finial is held in position by a rod passing down the centre and bolted. The example is not in any way given as a model to be copied, but merely as indicating a feature in which craftsmen may expend a little more interest than in the rougher kinds of work.

PORCHES have frequently to be erected, not only for domestic but also for ecclesiastical work. They are specially suitable for the entrances to half-timbered houses. The example from the village church of Huddington, Worcestershire, is shown in fig. 171, and fig. 172 shows plan. The porch itself is 6 ft. 10 in. wide, 6 ft. 2 in. deep, and the front and back posts are out of stuff 11 in. by 6 in.

LYCHGATES are an especial type of work which lend themselves easily to the elaboration of the skilled carpenter. As a temporary resting-place for the coffin, anything very ornamental might be considered as somewhat out of place; at the same time a dignified, substantial, and not too plain treatment leaves plenty of scope for design. A shelter is indispensable to a lichgate, and is generally supported on curved braces tongued to the posts, and held in position by oak pins, which are allowed to project and tell their tale. The illustration (fig. 173) will explain the general principle of these constructions.

CONSERVATORIES.—Although these have often not received the atention they deserve, there is some scope for the carpenter. An end elevation is given of one lately erected, in which an attempt was made to improve on the ordinary stock pattern (fig. 175). The illustration shows the posts, out of stuff 6 in. by 4½ in., and the casements, and also of the moulded rafters and sliding sashes.

GATES have to be very carefully put together in consequence of the comparatively rough wear they have to undergo by opening, shutting, and slamming. The jointing should be carefully performed, and the horizontal timbers should be as continuous as possible, as the strain is mostly on them. A detail of a gate (fig. 181) is given, forming an entrance to a drive. The method of firmly securing the posts is shown. These are 9 in. square, and are taken below the ground to a depth of 4 ft. 6 in., and tenoned into a continuous sill, and held in position by struts, as shown. The gate itself is out of 4 in. oak, and is 3 in. thick for the principal timbers, the arching and the smaller uprights being of 1½ in. stuff, mortised and tenoned. The oak paling at the side is started to show the junction.

A GARDEN WICKET is shown in fig. 174. The gate is hung to iron staples in the wall by means of iron bands with looped ends, fixed to the style.

PALINGS.—Several types of these come under the carpenters' practice. They may be divided into (*a*) lattice fencing, (b) lapped paling, (c) open paling. Lattice fencing, fig. 182, consists of a number of laths, *a*, pegged across each other, and supported by rails, carried on posts, *c*, fixed at intervals of about 10 ft.

Lapped paling of cleft oak is shown in fig. 183; the pales, *a*, lap over each other, and are nailed to rails, *b*, tenoned into posts, *c*, a skirting board, *d*, being fixed along the bottom to serve as a finish.

Open paling is shown in fig. 184. Posts, *c*, are planted firmly in the ground from 8 ft. to 10 ft. apart; rails, *b*, two or more in depth, are tenoned into these, and on them the pales are nailed flat.

SUMMER HOUSES are objects on which the student may lavish a considerable amount of thought. Being of small dimensions, simplicity should be regarded as essential. The attempt so often made to *rusticate* these adjuncts to a garden may be regarded as pedantry. On the other hand, natural timbers may well be used. The most suitable are oak, fir, and larch. In landscape gardening, a well and simply designed summer-house of unsawn wood may be employed in out-of-the-way corners, but not made ridiculous by affectation, as if it belonged to some half-civilised person. As to the construction of these, if the reader has carefully followed these articles he will have grasped the methods of joining timber suited to any emergency. Such constructions may be suitably roofed with oak shingles, as being in harmony with the surroundings; these should be torn or rent from the log and not sawn, in order to stand the weather.

CARPENTERS' FURNITURE. — Although this may be deemed hardly to come within the scope of these articles, yet seeing that there has been a tendency of late years to drag the designing and execution of furniture out of the "quagmire" into which Tottenham Court-road has drawn it, and to take it, as it were, out of the upholsterers' hands, it is considered that it might fitly end this article.

Of all things which the architect may design, furniture will assuredly teach him the most. The sizes are practically fixed, and he must keep to them, which as a training in regard to fitness is excellent. Of benches, tables, chairs suitable for halls, and having more of the stability and solidity than is usual now-a-days, there are many examples of the Elizabethan and Jacobean period in the South Kensington Museum and elsewhere which should be measured and drawn to scale by the student; fig. 185 is an example of the true principles of construction, although the decorative portion of the design cannot be recommended in every respect as an example. Individuality should be stamped on furniture as on the carcass of the house itself; and in reality there seems a tendency, which we hail with satisfaction, among the more educated classes, to allow the architect to design the whole of the internal fittings of his house. In the past, such fittings were a necessary complement of the architecture proper. What would the interior of an Elizabethan Hall be without its carved overmantel, its characteristic doors and enrichments, its sturdy table—not covered with a cloth to hide its imperfections—and last, the richly-moulded arm-chairs made to last, not for the date of a passing fancy or fashion, but the life of the structure itself.

GENERAL BUILDING NEWS.

THE BRITISH HOME FOR INCURABLES, STREATHAM.—On the 31st ult., the Duchess of Teck attended the service in the chapel of this building to dedicate the fittings which have been given by various friends. The Home itself was completed and opened by the Princess of Wales in July, 1894. Since that time the chapel has been added at the cost of Miss Leicester. It is a lofty Gothic structure of red brick inside and out, with white stone dressings. On plan it consists of a nave of three bays, with sanctuary at the east end. The columns are very tall and slight, the double arcade supporting pointed vaults of red brick, which are repeated on the south, and are supported by the single columns and the south wall. The fittings dedicated consist of a communion railing of hammered iron and brass; a gallery railing also of hammered iron of simple treatment. This gallery, which is at the west end, is on the level of the first floor of the home, and is intended for those patients whose infirmities render it difficult for them to descend to the nave; the pulpit is of Austrian oak, hexagonal on plan, on a massive moulded stone base; each face of the pulpit contains a cusped open arch, filled with wrot ironwork in flowing curves; the reading and priest's seat, also of oak; a credence table is also of oak, octagonal on plan, carved on a projecting stone corbel. At the east end of the north aisle are choir-stalls, also of oak, of design in keeping with the reading-desk opposite. The organ, placed in a small aisle at the north of the sanctuary, stands on the level of the raised sanctuary floor; the case is of oak, the lower part in square panels, the upper part overhanging and forming a canopy supported by curved ribs. The structure of the chapel was designed by the late Mr. Arthur Causton, and completed by Mr. Edwin T. Hall, the present architect of the home, who designed all the internal oak fittings, the organ case, railings, &c. The organ was constructed by Messrs. Bishop & Son, the oak and stonework of the other fittings by Messrs. Laurie & Co., the railings by Mr. T. Brawn, and the brass tablets by Messrs. Cox, Sons, & Buckley.

NORTH RIDING INFIRMARY, MIDDLESBROUGH.—New operating-room, receiving-room, board-room, and two new wards are being added to the North Riding Infirmary, Middlesbrough, from the designs and under the superintendence of Mr. R. Lofthouse, Diocesan Surveyor, and Mr. T. A. Lofthouse, architect, of that town.

NEW SCHOOLS, ACCRINGTON.—The St. John's School extension scheme, Accrington, has been brought to a completion during the past week. It comprises a new infant school for 240 scholars, with cloak-room, lavatory, and teachers' room. A large class-room is separated from the main room by means of a glazed partition. The babies' room is entered directly from the entrance corridor and provided with exit to play-yard. The building is faced with Halifax stone, has wood block floors, and low-pressure hot-water heating apparatus. The ventilating appliances are by Messrs. Hatton, of Manchester. An unclimbable iron railing fixed on a dwarf wall surrounds the play-yard, which will be paved during the year. In the old school, which will in future be a "mixed" school, some of the internal walls have been removed, additional windows inserted, and cloakrooms provided. The work has been carried out during the past twelve months by local contractors under the direction of Mr. Henry Ross, architect, of Accrington.

ISOLATION HOSPITAL, DORCHESTER.—The new hospital at Dorchester for the isolation of infectious diseases has just been completed. The work has been carried out from plans prepared by the Borough Surveyor, Mr. G. J. Hunt. The building is constructed of brick, and set off with ornamental cresting and finals. It consists of two separate wards with a lobby and nurse's room dividing them. There are two beds in each ward, but with space for more. All corners are rounded. In an adjacent building will be rooms for caretaker and administrative department. At the westerly end of the enclosure are the outbuildings, consisting of laundry, disinfecting chamber, and mortuary. The buildings are enclosed by a brick wall.

TECHNICAL AND ART SCHOOL, LEICESTER.—A new technical and art school has just been commenced at Leicester. The building, including the site, will involve an outlay of about 32,000*l*. It will have a frontage of 215 ft., and will be four stories high. The two lower floors will be devoted to dealing with commercial and scientific subjects, and the two upper floors to a school of art and design. The building will be Renaissance in style, and the material used will be red brick, with dressings of Portland stone. The architects are Messrs. Everard & Pick, of Leicester, and the contractors are Messrs. T. & H. Herbert.

PROPOSED BATHS, MARYHILL, GLASGOW.—The plans for the new baths and washhouses for Maryhill, sanctioned by the Glasgow Corporation some time ago, have finally been approved, and it is expected that the erection of the baths and wash-houses will be at once proceeded with. In the plans now approved the swimming bath is 75 ft. by 35 ft. There will be six hot baths for women, private washhouse with drying stove, and thirty-five washing stalls with drying stoves, and three hydro-extractors are placed conveniently at different points in the wash-house. The plans have been prepared by Mr. A. B. M'Donald, City Engineer, and the cost is estimated at 10,000*l*.

BOARD SCHOOL, LEEDS.—A new Board school has just been erected in Green-lane, Leeds. The building, which has been erected from designs prepared by Mr. W. S. Braithwaite, is built of red brick, relieved with stone dressings. It is intended for the junior boys and girls, and has been erected on a portion of the playground in front of the existing schools, facing to Green-lane. The new school has a frontage of 238 ft., and goes back 37 ft. into the playground. Owing to the limited site, it has had to be erected on what may be termed the corridor principle. It provides accommodation for 250 scholars, in four class-rooms on the ground floor, which contains in addition a cooking-room, scullery, and a large manual instruction-room, 56 ft. by 33 ft., for eighty senior boys from Green-lane and other neighbouring schools. On the first floor there are five class-rooms, with an aggregate accommodation for 320 scholars, as well as a central hall, 53 ft. by 33 ft. At the extremities of the building are placed the staircases, cloak-rooms, and lavatories, and from end to end of the school there runs a corridor 7 ft. in width, giving access to the various rooms. The total accommodation of the school is for 630 children, exclusive of the 80 who will be instructed in the workshop. In the centre of the front elevation is a large entrance archway, wrought in stone, and leading to the general playground, and the two ends of the building are flanked with towers, in which are placed the conveniences. Between these towers a large roof playground, with an area of 700 square yards, is provided for the junior girls. The playground is protected all round with high battlemented walls supported on arches, which are filled with iron grills. The internal woodwork has been carried out in yellow pine, stained and varnished, and the corridors, central hall, staircases, and cloak-rooms are lined throughout with glazed bricks, the walls of the class-rooms being similarly treated to a height of 4 ft. from the floor. The contractors are as follows:—Brick and mason work, Mr. Paul Rhodes; joinery, Messrs. Ledgard & Son; plumber's work, Messrs. W. & C. Barrand; ironfoundry work, Messrs. Autty & Co.; smith's work, Messrs. Taylor & Parsons, Bradford; slating, Mr. James Season; painting, Messrs. Roylance & Horsman; plastering, Mr. J. Dixon Dakin; gas pendants and coronas, Mr. J. W. Longfield, Otley; and heating (on the low-pressure system), Messrs. Newsum, Roberts, & Co.

BRANCH FREE LIBRARIES, LEICESTER.—The Mayor (Ald. E. Wood) opened two branch libraries in Leicester on the 9th inst. At the Aylestone Park site the branch library has an entrance from Richmond-road. The building is of brick, and is lit with gas. The reading-room is 45 ft. by 24 ft., with a height of 20 ft. 6 in. to ceiling, and the portion

reserved for the lending department is 15 ft. by 20 ft. The architects are Messrs. Harding & Topott. The Knighton Library, in Clarendon Park-road, is faced with Ellistown pressed bricks, with dressings of Darley Dale stone. A wrought-iron railing encloses the site. The library and reading-room, 50 ft. by 27 ft., has a portion reserved for bookcases and counter, and a librarian's private office is arranged for. The lady readers are separated from the general public by a rail. The fittings are from the Borough Surveyor's design. The contractor for the building is Mr. J. O. Jewsbury, and the architect is Mr. Arthur A. Hind.

TECHNICAL INSTITUTE, DARLINGTON.—On the 11th inst. the foundation stone was laid of the Darlington Technical Institute. The building is being erected from the designs of Mr. G. G. Hoskins, architect, of Darlington. The chief materials employed in the construction of the building are hand-made bricks of local manufacture and terra cotta. The east—or principal—front (towards Northgate) is about 142 ft. in length, the height to the eaves being something like 40 ft. above the level of the street. In the centre of this front is situated the main entrance, and a feature will be the central tower, rising to a height of 70 ft. The south front is about 132 ft. in length, and of a similar height to the east front, and abuts upon the proposed new street connecting Gladstone-street and Northgate. The accommodation provided in the building is as follows:—Semi-Basement —Joiners' shop, workshop, metal work room, plumbers' shop, physical laboratory, students' common room, and lockers, and two rooms for instruction in domestic economy. There are also heating and fuel chamber, engine and dynamo room, accumulator chamber, cleaner's closet, &c. Ground-floor—Museum (to be used as a temporary chemical laboratory), balance, and private library, chemistry store, three classrooms, physical lecture-room, engineering drawing-room (temporary museum), room for optical experiments and photography, administration room, secretary's and porter's rooms, lavatories, &c. First-floor — Art school (comprising life, antique, and painting), modelling, and elementary rooms, art master's room, and three classrooms. Provision is also made on the site for future extension, embracing lecture, theatre, and preparation room, chemical laboratory (one story in height as originally designed), and experimental engineering shops. The contractors are Messrs. J. W. & M. McKenzie, the sub-contractors being, for terra-cotta, the Leeds Fireclay Company, Limited, Burmantoft's Works, Leeds; heating and ventilating, Mr. G. Denham, Darlington; and fire-proofing, Messrs. S. Ferguson & Sons, Carlisle; carpenter and joiners' work, Mr. R. T. Smith; slaters' work, Mr. J. Wandless; plasterers' work, Messrs. T. Robinson & Sons; plumbers' work, Mr. Emmerson Smith; glazing, Mr. R. Smith; painting, Messrs. W. H. & W. H. Hoskins. The clerk of the works is Mr. J. Dalton.

BELFAST CATHEDRAL.—Plans have been received by the officials of the parish church, Belfast, from Messrs. Drew & Lynn, architects, showing how the project of the Belfast cathedral can be carried out. The drawings, according to the Belfast *News-Letter*, consist of a plan of the entire cathedral, a section showing the interior lines looking east, and the east window, and also two smaller plans showing how much can be done by only occupying the ground now in possession of the church. There is also a sketch of the central tower and west end of the cathedral, facing Donegall-street. The architects estimate that for an outlay of from 20,000*l.* to 25,000*l.* the nave and lower part of the tower can be built, which will serve all the purposes of a parish church, and accommodate a congregation of 1,200 persons. After this is done it is hoped that the remaining portions of the sacred building can be proceeded with in future years.

PUBLIC LIBRARY, NUNHEAD.—The foundation stone was laid on the 11th inst. of a public library at Nunhead. The cost is estimated at 2,500*l.* The library will hold 10,000 volumes. In the rear there will be a magazine-room, 24 ft. by 15 ft., with a news-room 38 ft. by 25 ft. Domestic offices, librarian's apartments, and other chambers will be added. The design is of the Tudor period, and the building will be top-lighted. Mr. R. P. Whellock is the architect, and the contractors are Messrs. F. Gough & Co.

WORKHOUSE ACCOMMODATION, LIVERPOOL.—At a recent meeting of the Liverpool Select Vestry, held at the Workhouse Offices, Brownlow Hill, the report of a special committee of the vestry on workhouse accommodation was considered. It was decided to adapt the Kirkdale Building and to erect pavilions in front of the present schools, in accordance with the report of Mr. E. Kirby, architect, Liverpool.

WORKHOUSE INFIRMARY, KNARESBOROUGH, YORKSHIRE. — A new infirmary at the Workhouse, Knaresborough, is approaching completion. The new infirmary is a two-storied building, built with hammer-dressed wall stone from local quarries, with ashlar dressings. On the ground floor, the administrative block contains nurses' room and ward kitchen, medical officers' room, day room, bath rooms, store room, and necessary sanitary conveniences for the staff. The main entrance is on the south side of the building, with vestibule and hall, from which a corridor leads to the entrance of the larger ward. The first floor is reached by a stone staircase. On this floor are provided duplicate nurses' room, ward kitchen, store room, day room, and bath rooms, whilst one room is set apart as a smoke room for convalescent patients. The two large wards, each accommodating twelve patients, are 36 ft. by 24 ft., and 12 ft. high, and are situated on the west side of the administrative portion. At the extreme ends of these wards, and cut off by ventilated lobbies, are placed the sanitary conveniencies, which are lined entirely with white glazed bricks. An iron staircase leading from the lobby on the first floor is placed on the outside of the building. The whole of these floors are fireproof, and are covered with patent wood block flooring, wax polished. Fresh air is admitted close to each bed at the floor level, and passes over heated pipes. The various contractors for the work were:—Masons' and bricklayers' work, the late Alderman James Simpson, Harrogate; carpenters' and joiners' work, Messrs. Lupton & Ryder; plumber and glazier, Mr. Henry Lindley, Leeds; plasterer, Alderman C. Fortune; slaters, Messrs. J. & W. Baynes; painter, Mr. Joseph Morley, Knaresborough; and Mr. Fletcher, Harrogate, clerk of works. The whole of the work has been carried out under the supervision of the architect, Mr. T. Edward Marshall, Harrogate.

PRIMITIVE METHODIST CHAPEL, AUDLEY, STAFFORDSHIRE.—On Easter Monday the memorial-stones were laid of a new Primitive Methodist chapel at Audley. The building will be 66 ft. long and about 57 ft. wide. The gallery will be semi-circular, and the choir seats will be behind the rostrum. Accommodation will be provided for about 700 worshippers. The style of the chapel will be Gothic, and the materials used will be best local bricks and stone. The contract for the whole of the work has been let to Mr. Daniel Maddock, of Audley, for the sum of 2,320*l.*, and the architect is Mr. J. D. Mould, of Manchester.

EXTENSIONS AT CROSLAND MOOR WORKHOUSE, YORKSHIRE.—The new maternity wards at the Crosland Moor Workhouse were opened on the 11th inst. by Miss Siddon. The new wards are Gothic in style. They are faced with local stone and covered with blue slates, and consist of a couple of wards, one for two beds and the other for five beds, with nurses' room, bathroom, and the necessary conveniences. A long covered corridor has been constructed from Hospital No. 2 to Hospital No. 3, and the entrance to the maternity wards is from this corridor. The work has been carried out by the following firms: Masons, Messrs. B. Graham & Sons; joiners, Messrs. B. Hirst & Sons; plumbers, Messrs. Milnes & Garside; plasterer and painter, Mr. Richard Heaton; slaters, Messrs. Pickles Bros.; and wood block flooring, Mr. John Cooke, all of Huddersfield. A new heating apparatus has been inserted in Hospital Nos. 1, 2, and 3, by Messrs. T. A. Heaps & Co., of Huddersfield. The builders' work in connexion with this has been done by Mr. W. Waring. New porches have been erected to the front entrance of Hospital No. 1 by Messrs. James Blakeley & Sons, of Netherton. The work has been carried out from the plans of Messrs. John Kirk & Sons, architects, of Huddersfield and Dewsbury, who have superintended the work. The total cost, which includes alterations to the old receiving and vagrant wards, is about 2,200*l.*

NEW THEATRE, CROYDON.—On the 6th inst. Mr. Beerbohm Tree opened the new Grand Theatre and Opera House at Croydon. Mr. Brough was the architect.

CHANCEL, DORE CHURCH, DERBYSHIRE. — A new memorial chancel has just been consecrated at Dore Church. The dimensions of the chancel are 19 ft. by 27 ft., and it has been erected in grey stone to harmonise with the main body of the church. The seatings are of pitch pine, and the roof is of the same material. The accommodation of the church is now slightly increased, as the choir will be moved from the nave into the seats in the chancel. The pulpit has been enlarged. The architect was Mr. J. D. Webster, of Sheffield, and the contract was let to Mr. J. Fletcher, of Dore, the masonry being sub-let to Mr. S. Hancock, of Fulwood.

RESTORATION OF TICKHILL CHURCH, YORKSHIRE.—Tickhill Church was opened recently, after undergoing alterations. The chancel walls, which were of rubble-stone, in a bad condition, the whole being covered with plaster, have been restored with Roche Abbey ashlar stone. A stained-glass window has been inserted over the chancel arch. This work was executed by Messrs. Powell Brothers, of Leeds. The mortuary chapel of the Laughton family has been opened out, and set apart for daily service. This part of the building was formerly used as a vestry and organ chamber, and the alterations have necessitated new arrangements. The organ has been moved from its former position in the chancel, and now faces west, on which side a new front of carved oak has been placed. The design was by Mr. J. Oldrid Scott, F.S.A., London, who was the architect in regard to the Laughton Chapel improvements. The chapel itself is separated from the chancel by an old rood screen, which has also undergone restoration. The new vestry has been made in the south-west corner of the nave. The oak screen is the work of Messrs. Badger & Son, of Sheffield, the designs having been furnished by Mr. J. D. Webster, of Sheffield, who has been responsible for the whole of the plans, with the exception of that appertaining to the Laughton Chapel. The sixteen clearstory windows have been filled with cathedral glass. The contractor for the masonry and other work has been Mr. R. H. Rawson, of Tickhill. The total expenditure on the alterations has amounted to upwards of 1,600*l.*

BAPTIST SUNDAY SCHOOL, DESBOROUGH, NORTHAMPTONSHIRE. — On Easter Monday the memorial stone was laid of the new Baptist Sunday Schools at Desborough. The structure is of a rectangular shape, and is to be erected in the Tudor style. In the front of the building will be two class-rooms, over these two rooms a larger room 32 ft. by 14 ft. will be constructed; at the back there is to be an assembly-room measuring 50 ft. by 32 ft.; further on is another room. The total length of the building is 81 ft. and 35 ft. wide. The whole of the floor is to be composed of wooden blocks laid on concrete; the front is to be built of best Ellistown bricks, and the doorway, dressings, etc., are of Ancaster stone. The rooms are to be heated by Marriott's hot water apparatus. Mr. W. T. Streather, Surveyor to the Urban District Council, is the architect, and Mr. J. Dawkins the builder.

CHAMBER OF MINES, JOHANNESBURG.—This building, which was recently opened, is erected on a site facing the Market-square, and adjoins the National Bank. The edifice rests on a solid bed of shaly rock. The bricks used throughout are of local make, including a special machine-pressed brick for front facing. The dressings of the ground-floor portion of the front are carried out in free slate sandstone. The dressings above the first floor are carried out in Portland cement plaster, coloured in rich terra-cotta. The carving comes from the studio of a young Hollander artist in Pretoria, Mr. A. van Wouw. The front gates of the building are of wrought iron work. The ground-floor is let as offices, with a large central corridor with tiled pavement running through the building. The ceiling of this floor is panelled, and the general effect is enhanced by breaking up the corridor into sections with intervening archways. Leading out of the centre of the corridor is the staircase-hall, which runs up the whole height of the building, the wide stairs winding round with an easy gradient. A richly-panelled dado next to the wall follows up to the top floor, and this, together with the woodwork of the stairs, is of polished walnut-stained Kauri pine. The staircase is lighted from two large windows and a top lantern, these being filled with specially-designed stained glass. The walls are covered with a rich Japanese paper, and the ceiling round the lantern is treated in two coves decorated with hand-painted work of special design. The feature of the staircase hall, however, is the screen on the first floor landing, which is executed in polished Kauri pine, walnut stained. The first floor is devoted entirely to the use of the Chamber, including secretarial quarters, committee-room, and the Council chamber. The chamber faces on to Market-square, and occupies the full frontage, being 49 ft. long by 32 ft. broad, and 18 ft. high, and contains five large arched windows, the fanlights of which are filled with stained glass. The woodwork of the room is also executed in Kauri pine. The second floor contains offices, let to several learned societies. Here also is the large museum. The artistic hand-painted work, the stained glass, and the wrought-iron work have all been executed by Mr. T. R. Spence, of London. The Kauri pine and better-class joiner-work was imported from Messrs. J. Garvie & Sons, of Aberdeen. The contractor was Mr. T. M. Cullinan, of Johannesburg; and the architects, Messrs. Emley & Scott.—*The African Review.*

HOSPITAL, EAST GRINSTEAD. — At a recen meeting of the East Grinstead Urban Council, the Isolation Hospital Committee reported that they had decided to instruct the Architect (Mr. J. G. Stephenson) to prepare plans in accordance with his accepted design for the hospital, except that each ward should be reduced to 40 ft. by 25 ft. instead of 60 ft. by 25 ft. The report was adopted without discussion.

BOARD SCHOOL, NEWCASTLE-ON-TYNE.—On the 13th inst. the new school erected at the instance of the Newcastle School Board, at Stepney, Shieldfield, Newcastle, was opened. Messrs. Plummer & Barrett were the architects, and Messrs. Middlemiss Bros. the contractors. Mr. W. Mather was clerk of works.

CHAPEL AND CELTIC CROSS, STRATHMARTINE, FORFARSHIRE.—At Strathmartine recently the little chapel of St. Luke's, formerly the school of the Lady Jane Ogilvy Orphanage, was consecrated for divine service, and a Celtic cross erected to the memory of the late Sir John Ogilvy, was unveiled in the old churchyard. The cross stands over 11 ft. in height. The cross shaft and arms are divided into panels, filled in with examples of the endless interlaced knot-work patterns. The cross is of pure Celtic type, and it rises from a base of three steps, upon the upper two of which are placed the commemorative inscription. The family burial-place, where the cross has been erected, is enclosed by a stone parapet wall, surmounted by a wrought-iron railing representing the diverging spiral of Celtic art, wrought in endless patterns; while in the ironwork of the gates of the

enclosure is worked in another and more usual form of the chrisma. New gates of wrought iron have been also fitted on the entrance to Strathmartine Churchyard. The cross and bases, which are all of Aberdeen granite, were supplied and erected by Messrs. D. Beveridge & Son, sculptors, Dundee and Perth; and the wrought-iron railing and new gates to the burying-ground were made and fitted up by Mr. William Nicoll, Dundee. The designs for the cross and railings were supplied by Mr. Alex. Hutcheson.

MISSION CHURCH, DURHAM.—A new mission church has just been built at Neville's Cross, Durham. The style of the church is late Early English, and the whole of the building, including dressings and window tracery, has been built with stone from the quarries of Messrs. E. & J. R. Taylor, the contractors, at Blackhill. The portion of the church now completed is the nave and vestry. The nave is 55 ft. long and 25 ft. wide, the vestry being 22 ft. by 12 ft. A chancel-arch, now built up, has been constructed at the east end to admit of a chancel being added at a future date. A similar arch has been formed at the west end of the nave, and which will in future open into the baptistry. Convenient entrances are placed at the south-west corner of the church and vestry. The outside stonework of the walls is snecked-rubble. The whole of the work has been carried out from designs and under the superintendence of Messrs. Plummer and Burrell, architects, of Newcastle-upon-Tyne and Durham. The cost of the building has been 1,000*l*. The sub-contractors were Mr. T. W. Blakey, Durham, slating; Mr. Pearson, Durham, plastering; Mr. Siddle, Consett, painting; Messrs. Reed, Milligan, & Co., Newcastle, glazing; Messrs. Heron Brothers, Durham, gas-fittings; and Messrs. Linning & Cooke, Newcastle, heating apparatus. The church will accommodate about 230 people.

RESTORATION OF WOLVERTON CHURCH.—The Parish Church of St. George the Martyr, Wolverton, was recently reopened, after enlargement and restoration. The chief alteration has been the provision of north and south transepts, each about 40 ft. long and 18 ft. wide, the two providing additional accommodation for two hundred worshippers. The coloured lancet windows in the north and south walls of the church have been removed to the transept walls. The tower has been opened into the church and north transept by two pointed arches. Other alterations to the tower include the raising of the ringing chamber 6 ft. A new vestry has been built on the north side of the chancel, entrance to the church from which is obtained by a door in the east wall of the north transept. The erection of this vestry necessitated the raising of the two windows in the north wall of the chancel. On the other side of the chancel the organ chamber has been opened out to the nave by the insertion of two additional arches. The alterations have been carried out in keeping with the architectural and other features of the church. The same local stone has been used for the new walls; and internally, Forest of Dean grey stone, Portland stone, Bath stone, and Red Hollington stone have been freely used. The roofs are of pitch pine, covered with Broseley tiles. The other alterations include the removal of the font from the east end to the centre of the nave, the reflooring of the aisles, and the reseating of the nave, the old seats being relegated to the transepts. The work has been carried out by Mr. Henry Martin, builder, Northampton. The architect was Mr. J. Oldrid Scott, F.S.A., London. The cost of the alterations and enlargement will amount, with the provision of new heating apparatus, to about 2,900*l*. The new oak seats, forty-nine in number, have been entirely made by coach finishers and coachmakers in their leisure time, spread over several months. In the west wall of the south transept a one-light lancet window, representing the Good Shepherd, has been erected. The window was executed by Messrs. James Powell & Sons, Whitefriars, London.

GRINTON CHURCH, SWALEDALE, YORKSHIRE.—The Lord Bishop of Ripon has just re-opened Grinton Church, near Reeth, which during the past twelve months has been undergoing restoration. The church has been restored at a cost of 3,000*l*. According to a local paper, the building is the only witness for most part as to its own history, and it is full of interest. There was, in all probability, a church here in Saxon times, of which the lower part of the tower is a remnant. In stripping off the plaster the mason found the north doorway with its Holy-water stoop. Evidently there was a chantry founded in the church, for when the plaster work was stripped off a mutilated piscina was uncovered in the south wall. The restoration was entrusted to Messrs. Hicks & Charleswood, architects, of Newcastle, and Mr. W. Simpson, of Darlington, has acted as clerk of the works. There is a new lead roof. New stained-glass memorial windows have been presented to the church. The one at the east is by Mr. Kemp, of London, and that on the north side by Messrs. Powell, of Leeds. The bells have been recast, silvered, and retuned by Messrs. Taylor, of Loughborough, and a new clock has been supplied by Mr. Potts, of Leeds.

WORKING MEN'S CLUB, FINEDON, NORTHAMPTONSHIRE.—New premises for the Finedon Working Men's Club have been erected on the Thrapston-road at a cost of 2,000*l*. The building, which is of red brick and Weldon stone, was erected by Mr. S. Abbott, of Finedon, from plans prepared by Messrs. Mosley and Anderson, architects, and consists of a bar, card-room, and games-room, on the ground-floor; and billiard-room, reading-room, and concert-room (to accommodate 300 persons) upstairs. At the back there is a bowling green and quoit ground.

SANITARY AND ENGINEERING NEWS.

NEW RESERVOIR, PAIGNTON.—The newly-erected reservoir at Paignton was opened on the 7th inst. The new reservoir is capable of holding 10,000,000 gallons. It contains the overflow of the old one, the water in the latter being supplied entirely by springs. Two new filters have been built in addition to the two old ones, and it is estimated that 200,000 gallons per day can now pass through. The water goes to the covered surface reservoir, which is capable of holding 100,000 gallons. From this is laid a 9-in. pipe, which is connected with the 6-in. main that goes to Paignton. The area of the new reservoir is 3½ acres, that of the old 1½ acres. Mr. J. Newton, C.E., of Manchester, was the engineer for the work.

WATERWORKS, HUDDERSFIELD.—Two new reservoirs, called Butterley and Blakeley, are now in course of construction for the Huddersfield Corporation, in Wessenden Valley. The Butterley reservoir, which is now nearing completion, is formed by an embankment placed upon the site of Upper Bank Bottom Mills, at the lower end of the Wessenden Valley, the top of which is 111 ft. above the bed of the stream. The capacity will be 400,000,000 gallons, the surface area will be 43 acres, and the greatest depth of water will be 98 ft. 6 in. As soon as this reservoir is completed, the two high level reservoirs situate higher up the valley will be utilised for domestic supply, and compensation water will be turned out of the Butterley reservoir in respect of the whole of the Wessenden Valley, namely, 2,258,640 gallons per working day. One or two engineering difficulties have been met with at Butterley. In 1894, when the excavation of the puddle trench had been carried down to a thick bed of hard shale, 80 ft. below the Wessenden Brook, it was thought that a satisfactory foundation had been reached, but careful examination showed the shale to contain fissures in several places, whereby water would freely escape. In order to secure a water-tight foundation it therefore became necessary to carry the excavation down into the shale bed below these fissures, and accordingly the excavation was continued into the shale to a depth varying from 10 to 34 ft. before all the fissures disappeared. The excavation of this shale, which is of extreme hardness, was very slow and tedious, as no explosive could be used without running a risk of shaking and damaging the foundation. The total depth of the excavation is—at the Binn end, 220 ft.; at the Hard end, 223 ft.; and at the lowest part of the trench, in the centre of the valley, 209 ft. below the level of the top water of the reservoir. Up to March of 1895 no less than 1,049,162*l*. had been expended on the works at the two reservoirs. The whole of the water supply is obtained by gravitation, and the drainage area of all the Huddersfield reservoirs is chiefly moorland or high mountain pasture, and the millstone grit formation. The engineers for the works at Butterley and Blakeley are Messrs. T. and C. Hawksley, London, and Messrs. G. and G. H. Crowther, Huddersfield.

STAINED GLASS AND DECORATION.

WINDOW, ST. GEORGE'S CHURCH, NEWCASTLE, STAFFORDSHIRE.—A memorial stained-glass window has just been unveiled at the Church of St. George's, Newcastle. The window has been placed on the north side of the church, and it represents in two lights the healing of blind Bartimeus. The work is by Messrs. Hardman & Son, of Birmingham.

WINDOW, ST. LUKE'S PARISH CHURCH, LEEK.—At St. Luke's Parish Church, Leek, a window has just been erected in the chancel to the memory of Mrs. Hilditch. The work has been done by Messrs. Heaton, Butler, & Bayne, of London.

MEMORIAL WINDOW, BRITFORD CHURCH, WILTSHIRE.—A new stained glass window has been lately erected in Britford Church, on the north side of the nave, in memory of the late John Gay Attwater. The glass is from the firm of Messrs. James Powell & Son, of Whitefriars.

FOREIGN.

FRANCE.—There is to be an exhibition of the paintings of the landscape painter Paraire, and of the paintings of Mdlle. Louise Abbéma, at the Georges Petit Gallery, in the Rue de Sèze.——The "Union Centrale Des Arts Décoratifs" has just published the programme of the competition for the 1900 exhibition. One part deals with the interior decoration of the house—furniture, utensils, &c., and the other part with the decoration of the person—stuffs, jewellery, &c.——The jury on architecture for the Champs Elysées Salon this year are MM. Charles Garnier, Daumet, Coquard, Pascal, Ginain, Guadet, Kaulin, Vaudremer, Laloux, Nenot, Loviot, Moyaux, Rouyer, Paulin.——The Pont Mirabeau, between Auteuil and Grenelle, has been finished to-day. It will be inaugurated on the national fête day, July 14, so that the sculptor, M. Injalbert, shall have time to finish the statues which are to be placed on the four piers. This bridge, which is one of the finest in Paris, is the work of the chief engineer, M. Résal; he is Professor of the Ecole des Ponts et Chaussées.——The monument to Emile Augier, by the Duchesse d'Uzès, of which there was so much talk last year, is to be inaugurated at Valence in August. The statue was rejected from the Champs Elysées Salon last year, but the Duchesse obtained permission to exhibit it in the Champs Elysées, close to the Palais de l'Industrie.——The restoration of the Palace of Constantine the Great at Arles (near the Rhône) is being carried on. It is one of the most interesting and curious of the ancient monuments in Provence.——The waters of the Rhône have been conveyed by means of a subterranean canal to the old town of Aigues-Mortes. Until now the town has been very badly supplied by wells and cisterns in a very doubtful state. The principal fountain will be at the base of the statue of Saint Louis.——The open competition started by the *Bâtiment* journal, for coach-houses for bicycles, has been decided as follows:—The first prize to M. Leon Vincent, architect; the second to MM. Petitgrand & Varlet (the former is an architect the latter an engineer), and the third prize to M. Georges Guet. M. Vaudremer, member of the Institute, presided over the jury——A new bridge is to be made at Clichy, to connect the new quarter of Clichy with the peninsula of Gennevilliers.——A Palais de Justice is to be built at Tunis on the Boulevard de Paris.——There is a talk of inaugurating the statue of Beaumarchais by M. Clausade, next July. This statue will be placed at the intersection of the Rue St. Antoine and the Rue Tournelles, close to the Boulevard Beaumarchais. The execution of the pedestal will most likely be given to M. Belestor, architect.——The Conseil General de la Vienne have just agreed that the dungeon of the Palais de Justice at Poitiers shall be restored according to the plans of Viollet-le-Duc.

ARCHITECT OF THE FEDERAL BUILDINGS, CHICAGO.—Mr. Henry Ives Cobb, of Chicago, has been appointed architect of the new Federal Building in that city, under the law permitting the Secretary of the Treasury to appoint in his discretion "skilled architects" to "assist the Supervising Architect" in the preparation of plans for public buildings. The public is certainly to be congratulated on the appointment. Mr. Cobb understands the peculiarities of the Chicago soil as well as any one living, and there is no danger that a building erected under his care will sink into the ground, like the present Government Building; while his skill as a designer will find ample field in a structure of the importance and solidity which would naturally characterise the Federal Building of Chicago.—*American Architect.*

NEW YORK PAVEMENTS.—Commissioner of Public Works Collis, of New York City, has directed that whenever an application for a permit to open a street is filed all other parties having conduits in that street shall be notified to apply for permits to do any work they have in contemplation, so that the street may be blocked for as short a time as possible. After repaving, on completion of such work, the street will not be torn up again for a year except in great emergencies. Gas companies laying mains in streets will hereafter be required to lay service pipes to all properties abutting on the street while the main is being laid, and no permits for service pipes will be issued afterwards.—*Engineering Record.*

MISCELLANEOUS.

THE LONDON GEOLOGICAL FIELD CLASS.—Professor H. G. Seeley, F.R.S., will begin the summer course of lecture-excursions with the London Geological Field Class at the end of April. The subject of the series will be the Physical Geography and Geology of the Thames and its Tributaries. This is the eleventh annual course. Mr. R. H. Bentley, 31, Adolphus-road, South Hornsey, N., is the Hon. Secretary to this Society, which gives a systematic course of teaching in the open country.

LLANDUDNO ELECTRIC LIGHTING.—The Llandudno District Council have adopted the report of Mr. A. H. Preece, it is stated, relative to the lighting of the town by electricity, and have decided to borrow 25,000*l*. to carry out the scheme.

SANITARY PROGRESS IN LIVERPOOL.—On the 13th inst. Dr. E. W. Hope, medical officer for Liverpool, read before the members of the Literary and Philosophical Society a paper entitled "A Short Review of the Progress of Sanitation in Liverpool." In the course of his paper Dr. Hope said that nothing could be more encouraging than a consideration of the extent to which, year by year, in the face of great difficulties and much opposition, sanitary administration of cities had become more efficient in organisation, more precise in direction, more successful in results. Although attention from time to time had been directed to the varying incidence of mortality and disease anterior to the passing of the Registration Act for England and Wales in 1842, as soon as that Act had been in operation for a few years the marked difference in the mortality of

town and country districts attracted the attention of careful observers. It became sufficiently apparent that various causes contributed to this difference, and Liverpool was as bad as any other town as far as the existence of these causes went. Here Dr. Hope gave a description of the condition of the insanitary courts, ill-ventilated cellar dwellings, and their defective draining, which existed in 1841 in the city, which then had a population of 223,000. The condition of all the large cities half a century ago was such as to furnish a very fruitful field for the application of hygienic principles. Vicious construction of dwellings, insufficient supply of out-offices and of receptacles for refuse and excrementitious matter, the absence of drains, the want of water, and the filth and the overcrowding of the population tended, amongst other evils, to produce one well-known and definite form of disease, typhus fever, and it was not surprising to find that one person in twenty-five of the working-class population of Liverpool was annually affected with this disease, and in more than one of certain streets specified during an average of five years no less than one in ten of the inhabitants was attacked yearly with fever. Phthisis and the various forms of tubercular diseases, the outcome of breathing and rebreathing contaminated air, were extremely prevalent. Dr. Hope next spoke of the steps taken of recent years to remedy defective sanitation in the city, and said that the gross result of the expenditure of money and time and pains might be indicated by the following consideration:—Taking a period of, say, the last thirty years, during which the progress of sanitation has been considerable, if during each of those three decennial periods the death-rate had remained at thirty-two, the figure at which it stood during the first of them, considerably upwards of 70,000 more deaths would have occurred during this period—in other words, a section of the community of the city now alive and well, numerically much greater than the whole of Warrington, or almost double that of Southport, would have been dead. That there is still room and need for further advance goes without saying, but it is not now the time to indicate the direction in which that improvement may be looked for. A discussion followed.

DISCOVERY AT AUSTERFIELD CHURCH, YORKSHIRE.—At the village of Austerfield, near Bawtry, Yorkshire, a most interesting discovery has been made in connexion with the church, which dates back to the Norman period. This is one of the two villages from which went the Pilgrim Fathers in the *Mayflower*. Whilst examining the church, with a view to restoration, the architect, Mr. Fowler, of Durham, discovered that the whole of the north side consists of a row of Norman arches perfectly preserved, which have been built up into the wall. The church is very small, the chancel being only about four yards, and the rest of the church about six yards wide. It has a splendid Norman doorway, and an arch in the same style divides the chancel from the body of the church. There is also an ancient font, recently rescued from being a drinking-trough for cattle, and an excellent old carved altar-table.—*Standard*.

GLASGOW TECHNICAL COLLEGE.—The architectural students of this college visited the new Sommerville Memorial Free Church, Keppochhill, near Glasgow, on Saturday afternoon last, by permission of Mr. W. G. Rowan, the architect. Mr. Sim, the clerk of the works, conducted the party over the church.——The closing lecture of the Scientific Society for the session was delivered on Saturday last by Mr. James Lochhead, Assistant Lecturer on Architecture in the College, the subject, "Our Modern Architecture," being treated by a division under two heads, historical and practical. After describing generally the development of architecture from the introduction of the Renaissance into England till the present day, in which the effect of literature was pointed out, the essayist led up to a consideration of the difficulties the latter-day architect had to contend with on reconciling modern research, progress, and invention in building materials, &c., with modern architecture, and advocated a closer sympathy between architect, client, and artisan and specialist. The lecture was illustrated by numerous lime-light views.

EAST LONDON WATER (HEIGHT OF SUPPLY) BILL.—In the House of Commons on Monday, on the order for the second reading of this Bill, Mr. Pickersgill said that the measure was designed to remedy an evil respecting which there were not only complaints from the inhabitants in all parts of the East-end, but from officials. One of the latter said that tenants on the upper floors of buildings had to beg water from the lower floors, and that, owing to insufficient pressure, the greatest inconvenience had been caused to occupants. The general law was that water must be sent to the top floor of the highest buildings unless private Acts provided otherwise. The East London Company's private Act provided that the company should not be required to supply water more than 40 ft. above the pavement. The New River Company was under obligation to raise water 70 ft. above the pavement. So it was clear that a Bill which would compel the East London Company to increase its pressure was needed. Unfortunately there was something else. His name appeared on the back of the Bill at the request of Bethnal Green Vestry, but there was the extraordinary fact that not a single member of the Council who was also a member of the House had been willing to back the measure. It appeared inevitable that it should be withdrawn, for the case of the East-end water consumers would be prejudiced by a decision on a Bill brought forward under such circumstances. The motion for the second reading was negatived, and the Bill withdrawn.

SOUND IN ITS RELATION TO BUILDINGS.—The Science Standing Committee of the Royal Institute of British Architects, acting on a suggestion made when the question of sound in its relation to buildings was under discussion last session, are instituting a series of inquiries with a view to collect and record fuller information on this subject. The lines on which the inquiries are based are indicated in the schedule of questions printed below, and it is suggested that members, whether residing at home or abroad, might facilitate the work by undertaking to study at least one important building in their locality, and reporting their observations to the Hon. Secretaries of the Science Committee at the Institute, 9, Conduit-street, London, W.:—1. Plan.—Give a general plan, with elevations and sections, of the *interior* of the building. 2. Materials.—Describe the materials of which the building is constructed, carefully noting the finish of the interior surfaces and the disposition of carpets, hangings, or other similar fabrics. 3. Construction.—The construction of the building should be described as fully as possible. 4. Seating.—Illustrate the method of seating by plan and section. 5.—Speakers, &c.—Show position of speakers or musicians in relation to the audience. 6. Effect of Audience.—The effect of an audience should be carefully noted. State it the room is better when partially or entirely filled. 7. Ventilation.—Describe in some detail the system of ventilation. If possible, note the mean and extreme temperatures and the effect of the variation produced by it and by changes in direction of the ventilation. State the position in which the thermometers are placed. 8. Keynote.—If the keynote of the building is known, state it, and say whether or not, if the voice is pitched in this key, any improvement in sound is noticeable. 9. Quality of Sound.—(*a*) State what is the general reputation of the building for (1) music; (2) speaking. (*b*) State what the quality of the sound is—full and resonant, &c., and note any peculiarity of effect, such as echoes and the like. (*c*) If defective, state the nature of the defect as carefully as possible. 10. Remedies.—If remedies have been tried to obviate defects, state them, and the result obtained. The precise nature of the remedy should be fully detailed. 11. Additional Particulars.—Add any particulars not above scheduled which may be considered necessary or desirable, and state age of building. 12. References.—Give references (if any) to published descriptions of the building, especially those dealing with its acoustic properties. 13. Authority.—Give the names of experimenters and date of experiments. For purposes of classification it is requested that answers to each of the foregoing questions be written on separate sheets of paper, headed with the name of the building experimented upon, and the subjects treated.

THE LONDON VESTRIES AND THE WATER SUPPLY.—A conference of delegates from Metropolitan Local Authorities took place on the 14th inst. at the Court-house, Marylebone-lane, W., for the purpose of considering whether the existing water supplies may not be so economised as to render any very costly scheme for an additional supply of potable water unnecessary. The conference was convened by the Marylebone Vestry. Mr. A. H. Hopkins (Marylebone) presided, and said they would all admit that it was rather wasteful to go to an enormous expense to use filtered water to throw down drains. He moved—"That this conference, having in view the report of the Royal Commission on the Water Supply, is of opinion that no such scheme as that recommended by the Chief Engineer of the London County Council for bringing water from Wales at an estimated cost of nearly 39,000,000*l*. should be proceeded with until proper inquiry has been made as to what economy of the existing supply could be effected by using unfiltered or sea water for sanitary purposes, and the probable cost." Colonel Barchard seconded the resolution. Mr. F. W. Grierson, engineer, stated that the Bill drawn up by the company for bringing sea water to London did suggest a maximum of 10s. per thousand gallons, but that charge had been reduced to 5s., though it was not even intended to charge that amount. Mr. Lidiat (Wandsworth) said sea water for street watering had been used in some fifty places, and only one authority had discontinued its use. The resolution was adopted.

LAUNDRY EXHIBITION, AGRICULTURAL HALL.—The fourth of the Laundry and Sanitary Exhibitions will be opened at the Agricultural Hall on the 26th. It is stated that about 80,000 persons visited the last year's exhibition, and the promoters promise a greatly increased number of exhibits this year.

SANITARY INSTITUTE.—At an examination for Inspectors of Nuisances, held at Birmingham on Friday and Saturday, April 10 and 11, the following candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances:—A. Bedingham, Nuneaton; W. G. J. Clark, Leicester; Miss E. C. Dawe, Birmingham; G. P. Deeley, Brierley-hill; A. W. Griffiths, Abergavenny; S. Prothero, Birmingham; A. Salt, Birmingham; H. J. A. Starkey, Willenhall; F. Thompson, St. Nechells; H. Walker, Smethwick, Birmingham; and A. Withers, West Bromwich.

JOIST AND GIRDER ALBUM.—We have received from Mr. Archibald D. Dawney a copy of his small and very convenient album of sections of steel and iron girders, joists, columns, stancheons, &c., with tables of their safe limits for distributed loads. The book is so small as to be easily carried in the pocket if desired.

ADAMS & CO.'S SANITARY SPECIALITIES.—This is a very finely got-up illustrated catalogue of sanitary ware of all descriptions, closets, lavatories, service cisterns, urinals, &c. We may call special attention, among the lavatory fittings, to fig. 44, the heavy glazed slab lavatory range, supported on glazed-ware piers; the effect of this is far more satisfactory, and it is more sanitary, than the over-ornamented cast-iron standards so constantly seen, and which are not wanting in this catalogue. Of similar character is the excellent range of public wash-house appliances shown in fig. 232A, and the combined sink and lavatory, fig. 282. We may draw attention also to the patent water-pipe made with an indented side which allows for expansion in frost without bursting the pipe; we have had no evidence of the actual working of this invention, but if it acts as intended it ought to be employed everywhere. One or two special flushing cisterns shown in the catalogue are worth attention.

PUBLIC IMPROVEMENTS, DERBY.—On the 8th inst. Major-General H. D. Crozier, R.E., an Inspector for the Local Government Board, held an inquiry at the Derby Town Hall concerning an application from the Corporation for power to borrow the following sums:—13,185*l*. for purposes of electric lighting, 849*l*. for purposes of the Technical College, 750*l*. for the construction of a swimming bath in the Markeaton Recreation Ground, 600*l*. for a contribution towards defraying the cost of a bridge and siding on the Nottingham-road, 454*l*. for the improvement of Rosehill-street, 130*l*. for making a footpath between Western-road and Gordon-road, 2,000*l*. for an isolation hospital at the Borough Lunatic Asylum, and 374*l*. for street improvements.

HELLENIC SOCIETY.—The ordinary meeting of this Society is again postponed, to May 4, when Mr. Talfourd Ely will read a paper on "Some newly-discovered paintings at Pompeii."

CAPITAL AND LABOUR.

THE NOTTINGHAM BUILDING TRADE.—In regard to the dispute now in progress between the master stonemasons of Nottingham and their men with regard to the proportion of apprentices to men, the men still stand by their demand that only one apprentice be allowed for every six qualified journeymen. The masters are willing to have one apprentice only to six men until he shall have reached the age of 18, when they claim that, without any detriment to the journeymen, an additional apprentice of 14 years of age might be taken on.

THE BUILDERS' DISPUTE IN THE POTTERIES.—In reply to a request from the joint meeting of North Staffordshire builders, operative bricklayers, and labourers, the Board of Trade has requested Sir William Markby to act as umpire in their dispute. Sir William, having consented, will probably visit the Potteries for the purpose of hearing the matter in dispute argued on both sides. The bricklayers request an advance from 8d. to 9d., and the labourers from 5s. to 6d.

LEGAL.

HENRY BUSHELL *v.* THE TRUST AGENCY AND GUARANTEE COMPANY OF ENGLAND, LIMITED.

THIS action was brought to recover the sum of 124*l*. 9s., due under an agreement for payment of professional services rendered to the defendant company by the plaintiff, a quantity surveyor, carrying on business at 33, New Bridge-street, Blackfriars, E.C., in preparing certain quantities for proposed buildings on premises Nos. 24 and 25, King William-street, E.C.

The defence in the action was that no tender had been accepted by the defendant company in reference to the proposed works, and that, therefore, nothing was due under the agreement, although the services required of the plaintiff had been duly performed.

The action came on before Mr. Justice Day on the 15th inst., and the plaintiff then proved that he had received the order to get out the quantities in respect of the proposed works, and that in due course the quantities were submitted to the defendant company's architect.

Tenders were duly received, and were reasonable in amount, but the defendant company did not accept any tender, and had taken no steps to proceed with the proposed works.

The plaintiff claimed a commission of 2 per cent. on the amount of the lowest tender.

The Judge held that the plaintiff was entitled to

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Designs for Lodging House	Aberdeen Town Coun.	50 and 25 guineas	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Sewerage Works	Caerphilly U D.C.	A. C. Harpur, Surv. Council Offices	April 20
Five Houses, Silsden, Yorks.....	Wm. Sugden	J. W. Fishburn, Archt. Skipton-road, Silsden ..	April 21
Road Works, St. Michael's-road	Bedford U.S.A.	Boro' Surv. Town Hall .	do.
Additions, &c. to Manor Farm, Beningby	A. Wright.....	J. Earnshaw, Archt. Carlton House, Bridlington Quay.....	do.
Culvert, &c. Penypound, Abergavenny	Grammar School Govrs	E. A. Johnson, Archt. Abergavenny.....	do.
Kiosk on the Pier.....	Bournemouth T.C. ..	F. W. Lacey, Boro' Surv.	do.
*Construction of Sewer.....	Lewisham Bd. of Wks	Surveyor's Offices, Catford, S.E.	do.
Additions to School, Bell-street, Dorchester.....	National Schools Committee	A. L. T. Tilley, Archt. 16, Cornhill, Dorchester	April 22
Road Metal, &c.....	Sale (Cheshire) U.D.C.	A. G. M'Beath, Surv. ..	do.
Storage Reservoir, Digley Mills, near Holmfirth	.....	J. Barrowclough, Holmfirth	do.
Eight Houses, Kirkland-avenue, Baildon, Yorks..	.....	J. Robertshaw & Sons, Arch. 53, Tyrrel-st. Bradford ..	April 23
Laundry, Barton Reg's Workhouse, Eastville, Bristol.....	.....	F. W. Wills, Archt. Small-street, Bristol	do.
Stables and Offices..	Ipswich Co-op. Soc. ..	Eade & Johns, Archt. Cornhill-chambers, Ipswich ..	do.
Improvement Works, Boy-lane	Halifax Corporation..	E. R. S. Escott, C.E. Town Hall	do.
Theatre, Chesterfield	E. Darbey	Rollinson & Son, Archt. Corporation-st. Chesterfield	do.
*Broken Granite	Long Crendon R.D.C.	The Clerk, 16, Corn Market, Thame.....	do
*Mendip Stone.....	Thame R.D.C.....	W. Parker, 16, Corn Market, Thame	do.
*Sixty or more Cottages	Tredegar Workmen's Building Society . ..	Tredegar Iron & Coal Co.'s Offices, Tredegar	do.
Shop, House, &c. Marsh Side	Workington Dist. Indus. & Prov. Soc. Lim.	Scott & Co. Archt. Victoria-buildings, Workington..	April 24
Alterations, &c. to Workhouse	Abergavenny Union..	F. Foster, Archt. Woodstock-house, Abergavenny	do.
Five Houses, Station-road, Barnsley..	Barnsley British Co-op. Soc. Lim.	Senior & Clegg, Archt. 15, Regent-street, Barnsley	do.
School, Farsley, Yorks	Calverley (U.D.) Sch. Board	W. & J. B. Bailey, Archt. 9, Market-st. Bradford ..	April 25
Seven Cottages, Aberford, Leeds.....	.....	Parlington Estate Office, Aberford	do.
*New Footpath	Spilsby R.D C.	F. J. Dixon, Dist. Surv. Spilsby	do.
Whinstone Road Metal (2,000 tons) ..	Scarborough R.D.C. ..	W. O. Woodall, Clerk, 32, Queen-street, Scarboro'..	April 27
Additions to Workhouse	East Preston (Sussex) Union	H. Howard, Archt. Town Offices, Littlehampton ..	do.
*House, Stabling, &c.....	West Sussex Standing Joint Committee....	C. Adcock, 5, Queen's-sq. Bognor	do.
*Police Station, Newmarket	West Suffolk C.C.	F. Whitmore, 17, Duke-street, Chelmsford	April 28
Sewers, Brick and Stone	Brighouse T.C.....	A. M. Fowler, C.E. 1, St. Peter's-sq. Manchester ..	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Additions to Schools, Harryville, Ballymena, Ireland	.....	Young & Mackenzie, Archt Donegall-sq. East, Belfast	April 28
*Designs and Tenders for Galvanised Iron Hospital	Spalding U.D.C.....	H. H. Harvey, Council Offices	do.
*Additions, &c. to Chapel	Plough Congregational Church, Brecon ..	104, Struet Brecon	April 29
*Paving	Greenwich Bd. of W.	141, Greenwich-road	do.
*Alterations to Latrines	West Ham Union	Clerk's Office	do.
*Pipe Sewers.....	Cromer U.D.C.	A. F. Scott, Church-st. Cromer	April 30
*Brick Rubbish and Flints	Hampton Wick U.D.C.	J. N. Horsfield, Council Offices, Hampton Wick .	do.
*General Offices and House.....	Willans & Robinson, Lim.	T. W. Willard, Archt. Rugby	do
*New Road.....	Elm Grove Estate, Barnes.....	T. & W. Stocker, 90 & 91, Queen-street, E.C. ...	May 1
*Alterations to Schools.....	Leominster National, &c. Schools Com.....	A. H. L. Barker, Archt. Hereford	do.
Sewering, Levelling, &c. several streets	Clayton-le-Moors U.D.C.	A. Dodgeon, Surv.....	May 2
*Construction of Arabic Museum and Khedivial Library, Cairo.....	Egyptian Government	Offices of the "Service Administratif"	do.
*Fever Hospital	Met. Asylums Board..	A. H. Tiltman, 6, John-street, Bedford-row, W.C.	May 4
*Enlarging Underground Convenience	Westminster Vestry..	G. R. W. Wheeler, Town Hall, Caxton-st. Westminster	May 6
*Asphalte Paving	do.	do.	do.
*Erection of Schools	Llanelly Technical School Committee ..	W. H. D. Caple, 1, St. John's-square, Cardiff ..	do.
*Painting and Graining	Essex Standing Joint Committee	H. Gibson, Esq. Chelmsford	May 7
*Main Drainage	Shrewsbury Corp.	J. Taylor, Sons, & Santo Crimp, 27, Gt. George-st. S.W.	May 8
*New Baths, Kensal Town, N.W.....	Chelsea Public Baths Commrs.	Harnor & Pinches, 5, John-street, Adelphi, W.C. ..	May 12
*New Infirmary Buildings	Wakefield Union	W. Watson, Barstow-sq. Wakefield	No date
Store, and Seven Houses, Morton Banks	Keighley Indus. Co-op. Soc.	J. Haggas, Archt. North-street, Keighley	do
Schools, Mount Stuart-sq. Cardiff	Trustees of Bethel Baptist Chapel	Jones & Co. Archt. 18, St. Mary-street, Cardiff	do.
Additions to Commercial Hotel, Bowness	H. Spencer & Co. Lim.	R Walker, Archt. Windermere	do.
Additions to St. Mary's Church, Chepstow	.....	Seddon & Carter, Archts. Cardiff	do.
Parochial House, Strangford, co. Down	.....	J. J. O'Shea, Archt. 10, Chichester-st. Belfast	do.
Extension of Parsonage-road, Bradford	.....	B. Walker, Engineer, Exchange, Bradford.....	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Surveyor's Assistant	Harrogate Corp.....	2*l.* per week	April 21
*Water Fittings' Inspector.....	Ipswich Corporation..	35*s.* per week and uniform	April 22
*Building Inspector	Birkenhead T.C.	130*l.* rising to 150*l.*.....	April 27
*Clerk of Works	C. Adcock, County Surv. 5, Queen-square, Bognor.....	.....	do.
*Chief of Surveyor's Department	Poplar Bd. of Works..	500*l.* per ann. offices and assistants	do.
*Architectural Assistant (Junior)	Hull Corporation	60*l.* per annum	April 30

Those marked with an asterisk (*) are advertised in this Number. ***Competition, p. iv. Contracts, pp. iv., vi., viii., & ix. Public Appointments, pp. xviii., & xx.***

a reasonable commission, on the custom of his profession, although the job in connection with the quantities supplied was not carried out, and he gave judgment accordingly.

MEETINGS.

FRIDAY, APRIL 17.

Crystal Palace School of Practical Engineering.—Presentation by Mr. A. T. Walmisley of certificates awarded by the examiners. 12 noon.

SATURDAY, APRIL 18.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection and Demonstration at Sewage Outfall Works, Barking.

Northern Architectural Association. — Visit to the Trinity House (Quayside, Newcastle) and All Saints' Church.

MONDAY, APRIL 20.

Royal Institute of British Architects.—Messrs. Halsey R. Ricardo & Christopher Whall on "The Architects' use of Colour" (under the management of the Art Standing Committee). 8 p.m.

Society of Arts (Cantor Lectures).—Professor H. A. Miers, M.A., on "Precious Stones." II. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor H. Robinson on "Sewerage and Sewage Disposal." 8 p.m.

TUESDAY, APRIL 21.

Institution of Civil Engineers. — Discussion on (1) "The Thirlmere Works for the Water-Supply of Manchester," by Mr. G. H. Hill; (2) "The Vyrnwy Works for the Water-Supply of Liverpool," by Mr. G. F. Deacon, 8 p.m.

London and Middlesex Archæological Society.—The Rev. J. Stephen Barrass will exhibit the Parish Records of St. Michael Bassisshaw and will read a paper descriptive of their historical and antiquarian value. A collection of antiquities recently discovered in London will be exhibited by Mr. James Smith. 8 p.m.

Royal Victoria Hall, Waterloo-road.—Mr. T. Turner on "How Iron is made; or a day in a Staffordshire Ironworks." 8.30 p.m.

WEDNESDAY, APRIL 22.

Architectural Association (Discussion Section).—Mr. G. P. Sheridan on "Scamping Tricks in Building." 7 p.m.

Carpenters' Hall, London Wall (Lectures for Foremen in Carpentry and Joinery).—Professor Banister Fletcher on "Timber Roofs, also Composite Roofs." 8 p.m.

Society of Arts.—Mr. F. E. Ives on "The Perfected Photochromoscope and its Colour Photographs." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection and Demonstration of Artizans' Dwellings, Boundary-street area, Bethnal Green. 3 p.m.

Liverpool Engineering Society. — (1) Nomination of Council and Officers. (2) Discussion upon miscellaneous communications. 8 p.m.

THURSDAY, APRIL 23.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Charles Mason on "Scavenging; Disposal of House Refuse." 8 p.m.

Society of Antiquaries.—Anniversary meeting. 2 p.m.

Society for the Encouragement of the Fine Arts.—Second Conversazione, at the Galleries of the Royal Society of British Artists, Suffolk-street.

Society of Arts (Indian Section).—Captain C. Rolleston on "The Deserted City of Vijianagar." 8.30 p.m.

Institution of Civil Engineers. — Students' Visit to the Linde British Refrigeration Company's Works at Lower Shadwell. 2.30 p.m.

FRIDAY, APRIL 24.

Architectural Association.—Mr. Francis E. Masey on "The Present Position of Architecture at the Royal Academy." 7.30 p.m.

SATURDAY, APRIL 25.

Architectural Association.—Visit to the studio of Mr. Alfred Gilbert, R.A.

Sanitary Institute (Lectures for Sanitary Officers).—Inspection and demonstration at the Sewage and Destructor Works, Ealing. 2.15 p.m.

Edinburgh Architectural Association. — Visit to Inchcolm.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,280.—FIRING BRICK KILNS: *B. H. Thwaite and anr.*—The invention relates to firing kilns for burning bricks, &c., with gaseous fuel, thus not only securing economy but more uniform and thorough burning of bricks. The burning chambers of the kiln can be placed in connexion with the gas-generating chambers, but a special valve system, is arranged to establish a uniform combustion of gas over a perforated rectangular or other form of floor, for the burning of pottery or brick goods.

5,294.—ASHPIT DOOR FASTENERS: *T. J. Gray.* — Relates to an improved fastener for ashpit and other doors, which is a plane of iron, similar to the bolt of a lock, with one end turned at right angles. A hole is put through at the base of the angle; a nut is placed at the angle right opposite to the hole; through the hole a screw bolt is put and screwed through the nut; the bolt end is then riveted. The object of the angle is to hold the nut in the same position as the sneck.

7,388.—WINDOWS: *Felix Fremont.*—This patent relates to windows having sliding sashes and has for its principal object the making of both sides of such, accessible for cleaning. In order to effect this the inventor provides each of the sliding sashes with a supplementary frame, which may be pivoted horizontally or vertically, or hinged to turn inwardly or outwardly in horizontal or vertical planes.

8,520.—GULLY TRAPS, &c.: *R. Frame.*—The gully, grease, or other trap proposed, consists of a tapered metal box or casing, having a central opening made in the apex of its bottom, which is more or less cone-shaped. This box is set in a concrete, &c., bed, formed at top of branch of drain-pipe. In this trap is fitted a removable sediment-box. This, with the outer box, forms a water seal, and prevents the ingress of dirt or stones to drain, whilst permitting free ventilation.

8,666.—FASTENINGS FOR DOOR KNOBS: *J. J. Bailey.*—Referring to a former patent and differentiating present methods, the patentee declares the latter to consist in providing the door-knob with an "inner ferrule" provided with a female thread capable of engaging with the male thread formed on the handle of spindle. The outer surface of this inner ferrule bears a male screw to permit of it engaging with the "outer ferrule" attached to the knob itself, a webbed washer also aiding in the connecting.

8,681.—WEATHER TILING AND TILES: *W. Buck.*—Consists in forming the ornamental edges of weather or roof tiles or ridge tiles with the ornamental device formed in the central portion of the edge of the tile instead of at the farthest projecting portion of the ornamental edge, whereby better and more watertight joints are secured.

8,700.—CHIMNEY AND VENTILATING SHAFT TOPS: *J. P. Bruhn.*—The top, made of any desired suitable materials, is formed in the shape of a double cone, united at the bases. The lowermost of these is surrounded by a "mantle," forming on its exterior a number of hollow vertical spaces.

8,915.—MANUFACTURE OF VARNISH: *Hugo Flemming.*—In place of melting amber and copal before dissolving them in turpentine, as in the ordinary process of amber and copal varnish making, the patentee effects solution without previous melting by action of chlorhydrins of glycerine, especially dichlorhydrin and epichlorhydrin.

9,077.—CONSTRUCTION OF BRICK ARCHES FOR FLOORS, &c.: *E. Barachin, the Younger.*—The invention has for its object facilitating the construction of brick arches between iron girders and in similar positions, by the use of an apparatus consisting of a centering board provided with adjustable slides.

9,283.—ARTIFICIAL STONE: *W. H. Metcalfe and Another.*—Proposes to utilise the pottery waste known as "schraff," and other pottery waste, in the Staffordshire district, by mixing with Portland or other cement for the manufacture of paving slabs, tiles, mantelpieces, &c.

21,703.—WATER-CLOSET BASINS: *H. Malbon.*—Consists in the adoption of a specially manufactured grid,

which will prevent substances that are insoluble in water passing into the drain or trap.

21,756.—CONSTRUCTION OF TILES: *W. A. C. Waller.*—Has for its object the formation of effective locking roofing tiles. Patentee forms the tiles with a number of projecting portions on both surfaces of special shape, so adapted that when the tiles are in position the projections on the under face of one tile will engage with the projections on the upper surfaces of those immediately below.

NEW APPLICATIONS FOR LETTERS PATENT.

MARCH 30.—6,871, W. Thompson, Water Closets.—6,885, C. Ferguson, Tool-holder or Cutting-bar for Planing Machines, &c.—6,891, C. Wall, Ashlar Block for Walling.—6,903, J. Wyles, Jointing of Pipes, &c.

MARCH 31.—6,949, J. Shaw, Sliding and Reversible Window-sashes.—6,951, B. Phillipson, Surface Water Trap.—6,968, A. Fletcher, Connecting Metal-pipes to Earthenware Water-closet Basins, &c.—7,023, O. Owen, Manufacture of Cement or Plaster.—7,029, A. Weil, Roofing Tiles.—7,032, A. Clark, Method and Apparatus for Treating Wood.

APRIL 1.—7,059, J. Hamilton, Motor Roof Ladders.—7,064, W. Thomas, Pole for Snibbing and Unsnibbing and Lowering and Closing Windows.—7,069, H. Crudgington, Syphon-flushing Cisterns.—7,070, S. Hurd, Tinpieces.—7,083, J. Mellowes, Roof Glazing.—7,093, A. Winsloe, Roofing Dwelling-houses and all kinds of Buildings.—7,139, J. Scheibe, Apparatus for Closing Doors.

APRIL 2.—7,198, G. Viggars, Brick or Tile Die.—7,213, J. Howarth, Fireplaces.—7,227, C. Wall, Ashlar Block for Walling in Internal Work, with Cement Faces.—7,270, J. West and W. Jenkins, Kilns for Burning Bricks, Tiles, Cement, &c.

APRIL 4.—7,282, T. Stock and others, Syphon Flushing Cisterns and Water-Waste Preventers.—7,287, D. Barclay, jun., Telescopic Measuring Staffs for Surveying and Measuring Work.—7,289, H. Brocklesby and S. Greatrix, jun., & Bros, Limited, Gas Brackets, Pendants, &c.—7,295, J. Cowling, Drain Tests.—7,306, J. Meloin, Bakers' Ovens.—7,310, C. Schulz, Wall Works.—7,327, T. Fuller, Hanging Window Sashes.—7,333, E. & V. Hill, Supporting Sash Windows.

PROVISIONAL SPECIFICATIONS ACCEPTED.

3,855, J. Herrmann, Draught Generating Apparatus for Chimneys, Air Shafts, and Ventilators.—4,029, T. Elms, Joint for Drain, Gas, or Water Pipes, Gulleys, Traps, and Channel Pipes.—4,647, H. Enoch, Connecting Baths, Sinks, Lavatories, and Cisterns.—5,356, H. Kerr, Door Handles.—5,515, J. Wood, Sash Fasteners.—5,549, E. Codling, Intercepting Trap for Drains and Sewers.—5,706, A. Blackburn, Discharge Apparatus for Cisterns, &c.—6,045, W. Keen, Mortise Bolts.—6,288, W. Johnson, Sliding Pivoted Window Sashes.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

21,587, E. Tichenor, Window Sashes.—324, T. Franke, Window Fasteners.—4,298, C. Soar, Sanitary Pipes.—4,328, J. Staincliffe, Gulley Traps.—4 635, M. Landmann, Fireplaces.—4,747, S. Shimer, Rotary Cutter Heads for Wood-placing Machines.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 30.—By E. G. RIGHTON (at Evesham).

Evesham, Worcester.—36, 37, and 38, Merstow-green, and 1, 2, and 3, Groves-place, f., r. 43*l.* 6s. 8d. 525

A plot of building land, 1,770 yards, f. 215

North Littleton, Worcester.—"The Ivy Inn" and 1a. 1r. 18 p., f., r. 24*l.* 620

Enclosures of land, 39 a. 0r. 12 p., f. 1,730

By HEPPER & SONS (at Garforth).

Garforth, Yorks.—Enclosures of building land, 1½ acres, f. 545

By C. RAWLEY CROSS.

Shepherd's Bush.—3, 5, 18, and 21, Camden-gardens, u.t. 67¼ yrs., g.r. 36*l.*, r. 190*l.* 1,445

Kensington.—32, Melrose-gardens, u.t. 80½ yrs., g.r. 6*l.*, r. 36*l.* 350

4 and 12, Melrose-ter., u.t. 80½ yrs., g.r. 12*l.*, r. 80*l.* 800

35, Poplar-grove, u.t. 80½ yrs., g.r. 6*l.*, r. 40*l.* ... 400

Westbourne-pk.—9, Elcom-st., u.t. 71 yrs., g.r. 8*l.* 275

3, Pressland-st., u.t. 71¼ yrs., g.r. 6*l.* 175

304, Kensal-rd., u.t. 74 yrs., g.r. 7*l.*, r. 38*l.* 300

March 31.—By BARTON, SMITH, & CO.

Brixton.—389 and 391, Brixton-rd., and 1a, Cumberland-pl., f., r. 300*l.* 4,500

Tottenham.—40, Charles-ter., f., r. 26*l.* 265

By PERCIVAL HODSON.

Wood Green.—Southgate-rd., two plots of building land, f. 175

Leyton.—52 to 70 (even), Oakdale-rd., u.t. 85 yrs., g.r. 30*l.* 910

By HOLLAND & ANDREWS.

Hampstead.—22, Broomsleigh-st., u.t. 87½ yrs., g.r. 6*l.*, r. 30*l.* 245

By FOWLER POOL.

Bethnal Green.—193, Barnet-grove, u.t. 36 yrs., g.r. 5*l.* 10s., r. 52*l.* 270

By JONES, LANG, & CO.

Westbourne-pk.—27, Portnall-rd., u.t. 82½ yrs., g.r. 7*l.*, r. 38*l.* 310

By R. PRICE & SON.

Pimlico.—46, Hugh-st., u.t. 30½ yrs., g.r., 8*l.*, e.r. 50*l.* 340

29, Cambridge-st., u.t. 42 yrs., g.r. 7*l.*, r. 55*l.* ... 380

32, Alderney-st., u.t. 35½ yrs., g.r. 8*l.*, e.r. 55*l.* 505

By SEAGRAVE, BROWETT, & TAYLOR.

Kentish Town.—Malden-rd., f.g.r. 84*l.*, reversion in 62 yrs. 2,702

Quadrant-gr., f.g.r. 118*l.* 10s., reversion in 62 yrs. 3,752

By C. RAWLEY CROSS.

Kilburn.—6, 8, and 12, Messina-av., f., r. 130*l.* 1,785

20, Gascony-av., u.t. 85 yrs., g.r. 9*l.* 10s., r. 44*l.* 360

5, 6, 8 to 12, and 203 to 205, Loveridge-rd., u.t. 82 yrs., g.r. 75*l.*, r. 341*l.* 2,245

179, Loveridge-rd., u.t. 81½ yrs., g.r. 7*l.* 195

Shepherd's Bush.—45, 46, and 47, Richmond-gardens, u.t. 67 yrs., g.r. 27*l.*, r. 167*l.* 760

Blaistow.—3, 5, 7, and 9, Frank-st., u.t. 787 yrs., g.r. nil 640

Sydenham.—1, Gordon-ter., u.t. 82½ yrs., g.r. 10*l.*, r. 26*l.* 185

By SMITH & SONS (at Birkenhead).

Tranmere, Cheshire.—Sea Bank-rd., "Marine Cottage," area 2,238 yds., f. 1,200

Green-lane, a plot of building land, area, 1,593 yds., f. £410

By R. S. BENSON (at Darlington).

Darlington, Durham,—32 to 46 (even), East Raby-st., f. 1,370

6 and 8, Green-st., f. 208

10, Lawrence-st., f. 225

By T. WALKER & SONS (at York).

Huntington, Yorks.—Two enclosures of land, 16 a. 1 r. 11 p., f. 1,660

By ALEXANDER, DANIEL, SELFE & Co. (at Bristol).

Kingswood, Somerset.—Mount's Hill, a freehold house and 7½ acres of building land 1,530

By G. LOVITT & SON (at Coventry)

Coventry, Warwick.—Priory-st., "Priory Timber Yard," area, 3,970 yds., f. 1,950

April 1.—By J. H. BETHELL.

Forest Gate.—Red Post-lane, 13 plots of building land, f. 1,720

Sandringham-road, 6 plots of building land, f.... 312

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent, r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.		
ton	8/0/0	9/0/0
Teak, E.I. ..load	11/0/0	18/0/0
Sequoia, U.S. ft. cu	2/0	2/1
Ash, Canada load	3/5/0	4/10/0
Birch, do.	3/10/0	5/5/0
Elm, do.	4/0/0	5/5/0
Fir, Dantsic, &c.	1/10/0	3/0/0
Oak, do.	2/5/0	3/15/0
Canada	6/0/0	7/10/0
Pine, Canada red	0/0/0	0/0/0
Do. Yellow	2/15/0	5/0/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg..	5/0/0	8/10/0
Wainscot, Riga, &c., log	2/5/0	4/10/0
Odessa, crown...	2/5/0	4/10/0
Deals, Finland		
and & 1st std 100	9/10/0	9/0/0
Do. 4th & 3rd ..	9/10/0	8/10/0
Do. Riga	9/10/0	8/10/0
St. Petersburg, 1st yellow ...	10/10/0	13 0/0
Do. 2nd yellow	8 10/0	10,10/0
Do. white	8/10/0	10/0/0
Swedish	7/10/0	16/0/0
White Sea	8/10/0	15/10/0
Canada, Pine 1st	23/5/0	23/10/0
Do. do. 2nd	10/0/0	17/0/0
Do. do. 3rd, &c.	8/0/0	10/15/0
Do. Spruce, 1st..	9/0/0	20/10/0
Do. do. 3rd and 2nd	7/10/0	8 10/0
New Brunswick	7.0/0	8'0/0
Battens, all kinds	5/0/0	20/0/0
Flooring boards, sq., 1 in. prep, 1st	0/10 0	0/15'0
Do. 2nd	0/6/0	0/12/0
Other qualities—	0/5/6	0/7/0
Cedar, Cuba ..ft.	/4½	/5
Honduras, &c.	/4	/5
Mahogany, Cuba	/4	/6
St. Domingo, cargo av.	/4	2/3
Mexican do. do.	/4	/5
Tobasco do. do.	/5	/7
Honduras do. ..	/5	/6½
Box, Turkey ton	4/0/0	15/0/0
Rose, Rio	7/0/0	16/0/0
Bahia	6/0/0	15/0/0
Satin St. Do. ming	0/0/7	0/2/0

TIMBER *continued*.		
Satin, Porto Rico	0/0/7	0/1/6
Walnut, Italian....	0/0/3	0/0/7
METALS.		
Iron—Pig, in Scot- and .....ton	2/6/3½	0/0/0
Bar, Welsh, in London	5/12/6	5/15/0
Do. do. at works in Wales.....	5/2/6	5/5/0
Do. Staffordshire, in London.....	6/0/0	6/10/0
COPPER—British cake and ingot	48/0/0	48,10/0
Best selected ..	48/15/0	49.5/0
Sheets, strong..	56/0/0	0/0/0
Chili bars	44/10/0	44/15/0
YELLOWMETAL lb	0/0/4⅛	0/0/5½
LEAD—Pig, Spanish ....ton	10'18/9	11 0/0
English com. brands	11.0/0	11/2/6
Sheet, English, 6 lbs. per sq. ft. and upwards ..	12/0/0	0/0/0
Pipe	12 10/0	0/0/0
ZINC—English sheet .....ton	18,0/0	0/0/0
Vieille Montagne	18/5/0	0/0/0
TIN—Straits.....	59/2/6	59/12,6
Australian.....	60/0/0	60/10/0
English Ingots.	64/0/0	64 5/0
Banca.....	61 2 6	61 7 6
Billiton	60 7 6	60/10/0
OILS.		
Linseed .....ton	18 10/0	19 2 6
Cocoanut, Cochin	26/15/0	27/0/0
Do. Ceylon	22 15/0	23/0/0
Palm, Lagos	21/0/0	0/0/0
Rapeseed, English pale	23 15 0	24/5 0
Do. brown	22/5/0	22 15/0
Cottonseed refd. .	16 5/0	16/15/0
Oleine.....	19/10/0	20/15/0
Lubricating U.S.	6/6/0	9/0/0
Do. black	4/9/0	6/6/0
TAR—Stockholm barrel	19/5	1/0/0
Archangel	0'14/6	0/15/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender: and we cannot publish lists in which the accepted Tender is below £100, unless in some exceptional cases and for special reasons.]

BEDFORD.—For rebuilding house, St. John's-street, Bedford, for Mr. Geo. Turner. Mr. Richard Lund, architect, 8, St. Paul's-square, Bedford:—

White	£1,122	Harrison	£955
Foster	989	Warton	950
Coleman	968	Corby (accepted)	945

CHESHUNT.—For re-building the "Prince of Wales Public House" at Golf's Oak, Cheshunt, after fire, for Messrs. McMullen & Co. Mr. James Farley, architect, Hertford.

James Bunce	£965	T. Hunt	£839
A. F. Almond	940	J. A. Hunt	796
R. Archer	935	Walter Lawrence, Waltham Abbey*	760
L. and W. Patman	897		
C. White	875		

*Accepted.

EAST COWES.—Accepted for building a town hall, East Cowes, Isle of Wight. Mr. Jas. Newman, architect, Sandown:—
W. H. Brading & Son £1,900

ENFIELD.—For the erection of a Church Institute at Morley Hill, for the Rev. V. Travers Macy, M.A. Mr. William Pywell, architect:—

Hobbs & Son	£2,123	J. H. Savage	£1,950
Fairhead & Son	2,069	E. M. Smithers	1,921
L. & W. H. Patman*	1,973	John Crabb	1,450

[All of Enfield.]
*Accepted.

ILKESTON.—For the erection of villa residence at Heanor-road, Ilkeston, for Mr. Thos. Hollis. Mr. Samuel Richards, architect, 3, Market-place, Ilkeston.

Harper, John & Co.	£779	Richards, Wm.	£710
Donnelly, Wm.	742	Birkin & Rowland, Kimberley, Notts.*	676
Shaw, W. E.	740		

*Accepted.

KILLARNEY (Ireland).—For the execution of sewerage works at the workhouse, for the Guardians of Killarney Union. Mr. G. A. E. Hickson, surveyor, 25, Denny-street, Tralee:—

Michael Warren	£705 0	Wm. Baird	£624 14
Timothy Gallivan	663 16	John B. Healy, Tralee*	603 7

*Accepted.

LONDON.—For alterations and additions to 1, Rutland-gate, Knightsbridge, for Mr. John Rose Auldjo. Mr. R. Owen Allsop, architect:—

Maple & Co.	£1,222	G. H. & A. Bywaters*	£1,110

*Accepted.

LONDON.—For new hall and repairs to the Richmond-street Mission, Walworth, S.E. Mr. Geo. Baines, architect, 4, Great Winchester-street, London, E.C.:—

West Bros.	£2,164	T. J. Barden	£1,825
R. A. Lowe	1,899	C. & J. Bowyer	1,823
Balaam Bros.	1,882	S. J. Scott	1,747
Lilly & Lilly, Lim.	1,877	Battley, Sons, & Holness.	1,724
H. L. Holloway	1,850	Rice & Sons	1,707
B. E. Nightingale	1,848	T. D. Leng, 232, Evelyn-street, Deptford*	1,655
S. J. Jerrard & Sons	1,841		

*Accepted.

LONDON.—For rebuilding and fitting "The Sir Ralph Abercrombie," Charles-street, Hatton-garden, for Hodgson's Kingston Brewery Company. Mr W. M. Yetts, architect:—

Wagstaff	£4,181	Ashby & Horner	£3,615
Wallis	3,896	Shepherd	3,566
H. & P. Fearman	3,879	Hall, Beddal & Co.	3,520
Falkner	3,860	W. Downs	3,432
Gladdin	3,772		

REIGATE.—For the erection of (1) a lodge and (2) shed at "Hethersett," Reigate, for Mr. D. C. Apperly. Mr. R. H. Hall, architect, 3, Lombard-court, Lombard-street, E.C.:—

	1.	2.	Total.
Holloway	£865 0 0 ..	£90 0 0 —	£955 0 0
Waycott	780 0 0 ..	97 10 0 —	877 10 0
Gaze	789 0 0 ..	75 0 0 —	864 0 0
Messrs. T. Turner, Limited	737 0 0 ..	75 0 0 —	812 0 0
Bagallay	726 0 0 ..	80 0 0 —	806 0 0
Carrick	710 0 0 ..	75 0 0 —	785 0 0
Jones, Tonbridge*	660 15 10 ..	67 0 11 —	727 15 9

*Accepted.

RUGBY.—For works at Hillmorton House, Rugby, for Mr. Thos. Hunter. Messrs. Wm. Sugden & Son, architects, Leek and Hanley. Quantities by the architects:—

Stone Masonry.	Duston Stone.	Ham Hill Stone.
Shillitoe	£450 0 0	£400 0 0
Tanner (excluding part)	365 0 0	332 0 0
Slaymaker (excluding part)	339 12 9	330 10 9
busby, Rugby (accepted)	329 0 0	

Heating Apparatus.

Jones & Attwood £150 10 0
Haden & Son, Trowbridge (accepted, with addition of £14 2s. for further coils, &c., and of £56. 10s. for domestic hot-water service) 141 0 0

[The works generally are being carried out by direct employment of labour, under the superintendence of Mr. Satchell, clerk of works.]

SANDOWN.—For the erection of a school-room, &c., for the Baptist Church, Sandown, Isle of Wight. Mr. Jas. Newman, architect, Sandown:—

Hy. Attrill	£339 0	Barton Bros.	£298 10
Wm. Brown & Corney	328 10	Wm. Joliffe (accepted)	270 0

SHILLINGFORD HILL (Berkshire).—Accepted for greenhouses, drainage, and water supply. Mr. George Hornbower, architect, 20, Fitzroy-street, W.:—
Brasher & Sons, Wallingford £390 7 0

SLINFOLD.—For the erection of a private residence on the Hall Land Estate, for Mr. Wm. Grinsted. Mr. C. H. Burstow, architect, 40, North-street, Horsham:—

T. Ayling, with Tidy & Sons	£965	Hillman & Murrell	£850
J. Wadey & Sons	874	W. Street	838
G. Marden	869	R. Cook & Sons	8 9
		Henry Spooner, Loxwood*	750

*Accepted.

WESTON-SUPER-MARE.—For the erection of new business premises, Wadham-street, Weston-super-Mare. Mr. H. Dare Bryan, architect, Bristol:—

H. Shorney	£1,917	Hatherley & Carr	£1,485 0
Pollard	1,900	Forse	1,485 0
Love	1,585	Wilkins & Sons, Bristol*	1,318 10
Cowlin & Sons	1,543		

*Revised and accepted.

EASTHAMPSTEAD.—For new infirmary and other works for the Easthampstead District Council. Messrs. Charles Smith & Son, Reading, architects. Quantities by Messrs. Henry Cooper & Sons, Reading:—

—	Infirmary.	Extra if Balconies.	Extra for additional Nurses Rooms.	Additions to Porter's Lodge.	Total.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Walden & Cox	6,850 4 10	82 17 2	168 3 1	301 9 3	7,402 14 2
T. Pilgrim	5,950 0 0	83 0 0	400 0 0	375 0 0	6,808 0 0
C. Clements	6,109 0 0	60 0 0	140 0 0	279 0 0	6,678 0 0
Stokes	5,884 0 0	63 0 0	387 10 0	322 0 0	6,654 10 0
Norris & Son	5,790 0 0	59 0 0	142 0 0	284 0 0	6,275 0 0
T. H. Kingerlee	5,790 0 0	55 0 0	148 0 0	260 0 0	6,254 0 0
Watson	5,690 0 0	66 0 0	195 0 0	263 0 0	6,144 0 0
J. H. Margetts	5,498 0 0	57 0 0	141 0 0	248 0 0	5,944 0 0
G. Simonds	5,400 0 0	74 0 0	160 0 0	270 0 0	5,904 0 0
Higgs & Sons	5,380 0 0	79 0 0	161 0 0	279 0 0	5,899 0 0
Tucker	5,351 0 0	54 0 0	149 0 0	262 0 0	5,816 0 0
W. Hawkins	5,365 0 0	52 0 0	132 0 0	279 0 0	5,766 0 0
G. Wernham	5,210 0 0	89 0 0	182 0 0	255 0 0	5,736 0 0
Lewis Brothers	5,250 0 0	56 0 0	138 0 0	250 0 0	5,694 0 0
Collier & Catley	5,190 0 0	49 0 0	129 0 0	257 0 0	5,625 0 0
Bottrell & Son	5,198 0 0	60 0 0	125 0 0	235 0 0	5,618 0 0
McCarthy E. Fitt	5,195 0 0	58 0 0	126 0 0	233 0 0	5,612 0 0
Hughes	5,177 18 9	52 4 4	118 12 8	221 11 6	5,570 7 3
W. J. May	5,116 0 0	56 0 0	125 0 0	237 0 0	5,534 0 0
D. Taylor	5,030 10 0	69 0 0	162 6 0	265 0 0	5,496 16 0

WANSTEAD.—For tar and stone paving in playgrounds of schools, for the Wanstead School Board. Mr. John T. Bressey, architect, 70 and 71, Bishopsgate-street Within, E.C.:—

J. J. Ingham	£1,043	5	0
Glover, Sheppard, & Co.	1,009	6	9
North of England Asphalte Co.	1,002	8	0
D. Marchn & Co.	926	3	0
John Jackson	902	0	0
Mack & Co.	895	0	0
A. C. W. Hobman & Co.	815	19	0
Asphaltic Limestone Concrete Co., Lim.	809	0	0
W. E. Constable & Co.	785	0	0
Josiah Smart	693	0	0

Surveyor's estimate, £840. 18s.

LONDON SCHOOL BOARD TENDERS.

THE following lists of tenders are for work for the London School Board :—

FINSBURY (Gillespie-road).—Repairing brickwork, cornices, stonework, &c.:—

G. Kirby	£224	0	0
Marchant & Hirst	208	0	0
Stevens Bros.	194	0	0
W. T. Ballard	187	6	
C. Dearing & Son	£183	0	0
J. Grover & Son	158	0	0
McCormick & Sons*	139	0	0

FINSBURY (Oldfield-road).—Exterior painting :—

G. Chase	£398	0	0
W. Lawrence	184	0	0
H. Knight & Son	182	15	0
W. Silk & Son	126	0	0
J. Grover & Son	£94	0	0
Marchant & Hirst	79	0	0
W. Shurmur	76	0	0
C. Willmott*	75	0	0

FINSBURY (Upper Hornsey-road).—Exterior painting :—

G. Chase	£336	0	0
J. Willmott & Sons	35	10	0
W. Hornett	35	0	0
G. Kirby	34	0	0
T. Cruwys	£33	0	0
N. Lidstone	28	10	0
Stevens Bros.	28	0	0
G. S. S. Williams & Son*	27	0	0

GREENWICH (Burrage Grove).—Exterior painting :—

J. H. Hodgin	£372	10	0
W. Banks	217	17	6
Johnson & Co.	£176	10	0
E. Proctor *	166	0	0

GREENWICH (Duke-street).—Exterior painting :—

W. Banks	£153	16	6
G. Barker	123	0	0
E. Proctor	£118	0	0
Jones & Groves *	109	0	0

GREENWICH (Stanley-street).—Exterior painting :—

W. Banks	£205	10	6
J. & A. Oldman	198	0	0
G. Barker	196	0	0
J. Otway	£190	0	0
E. Proctor	174	0	0
Jones & Groves*	144	0	0

HACKNEY (Catherine-street).—Exterior painting :—

H. Knight & Son	£210	0	0
G. S. S. Williams & Son	196	0	0
T. Nicholson	194	10	0
Vernall, Danes, & Co.	180	0	0
C. Willmott	£167	10	0
J. Grover & Son	162	0	0
J. Kiddle & Son	149	0	0
McCormick & Sons*	149	0	0

MARYLEBONE (Barrow Hill-road).—Exterior painting :—

T. Cruwys	£200	0	0
J. Willmott & Sons	196	0	0
W. Hornett	195	0	0
S. Callow	174	10	0
W. Brown	£135	0	0
Stevens Bros.	124	12	0
F. T. Chinchen	124	10	0
G. Foxley*	119	0	0

SOUTHWARK (Laxon-street).—Exterior painting :—

W. King & Son	£271	0	0
Rice & Son	253	10	0
Marchant & Hirst	247	10	0
J. Garrett & Son	230	0	0
G. Brittain	£218	0	0
Johnson & Co.	198	0	0
E. Triggs	196	0	0
H. J. Williams*	173	0	0

TOWER HAMLETS (Atley-road).—Exterior painting :—

T. White & Son	£261	2	3
A. E. Symes	230	0	0
Gibb & Co.	175	0	0
Atherton & Dolman	160	0	0
J. F. Holliday	£150	18	0
Staines & Son	129	0	0
G. Wales	128	10	0
J. T. Robey*	112	0	0

TOWER HAMLETS ("Ben Jonson").—Exterior painting :—

Atherton & Dolman	£351	0	0
G. Wales	326	0	0
J. Kybett	276	0	0
Gibb & Co.	265	0	
J. F. Holliday	£251	5	
Johnson & Co.	233	5	
J. Kiddle & Son*	187	0	

TOWER HAMLETS (Berner-street).—Exterior painting :—

J. Kybett	£222	0	0
T. White & Son	209	0	0
Atherton & Dolman	190	0	0
A. W. Derby	186	0	0
Gibb & Co.	£185	0	0
G. Barker	183	0	0
R. E. Nightingale	156	0	0
J. F. Holliday*	153	10	0

WEST LAMBETH (Bolingbroke-road).—Exterior painting :—

E. Flood	£220	0	0
W. Hammond	183	0	0
C. Gurling	145	12	0
Heinemann & Brown	115	0	0
Stimpson & Co.	£98	10	0
E. P. Bulled & Co.	97	0	0
R. E. Williams & Sons	95	0	0
E. B. Tucker*	93	12	6

WEST LAMBETH (Church-street).—Exterior painting :—

D. Charteris	£338	0	0
H. Mallett	194	10	0
H. Brown	175	0	0
Rice & Son	166	0	0
Maxwell Bros., Limited	140	0	0
G. Brittain	£136	0	0
G. Wood & Co.	134	0	0
W. V. Goad	124	0	0
Holloway Bros.	120	0	0
B. E. Nightingale*	97	0	0

Supply of Twelve School Board stove fronts:—

Bartle & Co.	£24	12	
Falkirk Iron Co.	16	15	
Carron Co.	15	0	
Yates, Hayward & Co.	14	14	
Hope Foundry Co.	£13	16	
McDowall, Steven & Co.	11	5	
Coalbrookdale Co.	10	1	
J. Grundy*	6	6	

The tenders marked with asterisks have been accepted by the Works Committee.

SUBSCRIBERS in LONDON and the SUBURBS, (by prepaying at the Publishing Office, 19s. per annum or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post*.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed), 1s.

TO CORRESPONDENTS.

H. T. (too late: next week).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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FOR ALL THE PROVED KINDS OF
BATH STONE.
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HAM HILL STONE.
The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

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SLATER and TILER.
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Oakeley - Portmadoc,
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LARGE STOCK READY.
CYLINDERS FOR HOT-WATER CIRCULATION.
Particulars on application.
LONDON:
352 to 364, EUSTON-ROAD N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.
LIVERPOOL:
6 and 8, HATTON GARDEN.
GLASGOW:
47 and 49, ST. ENOCH-SQUARE.

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

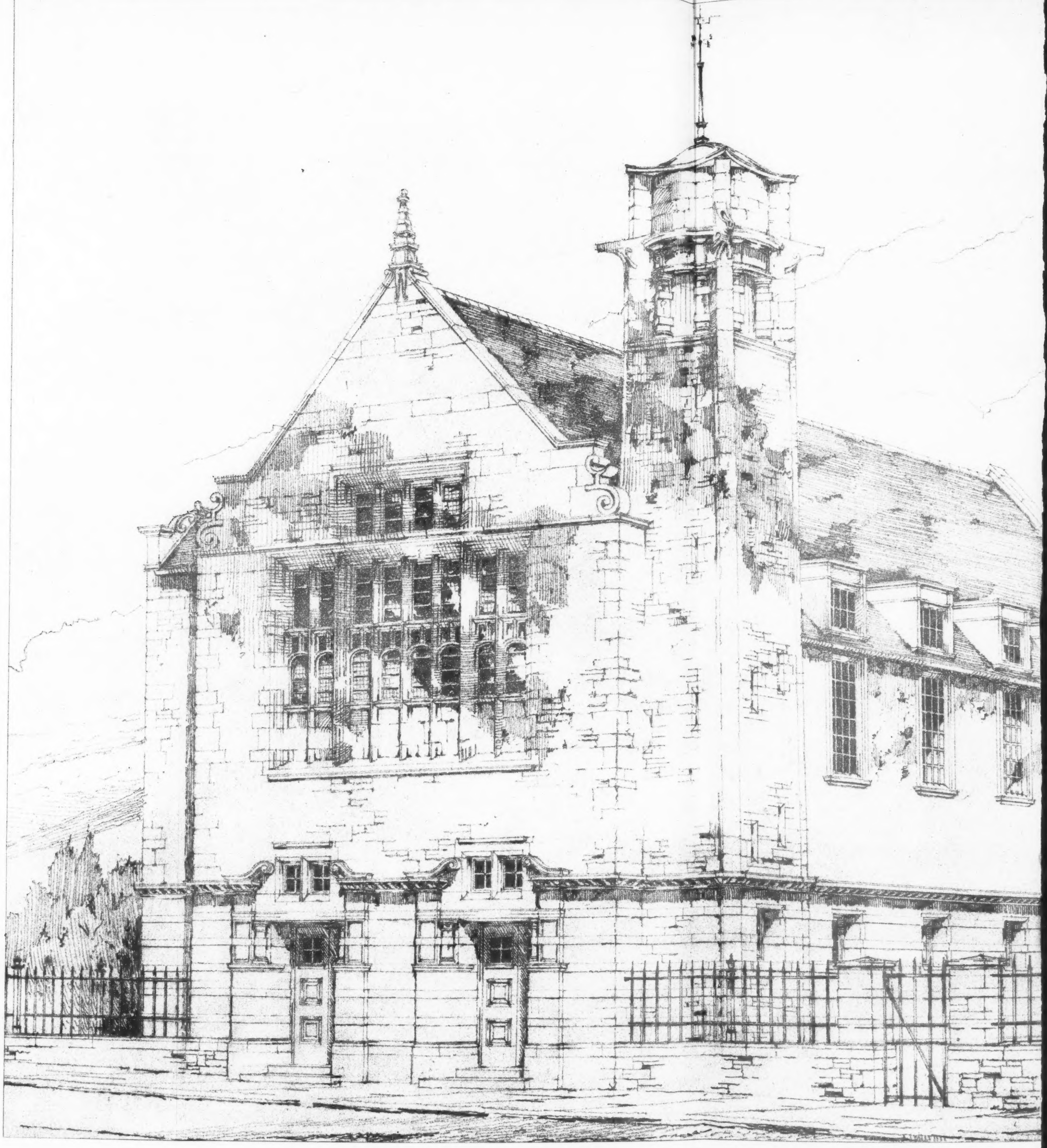
PAUL ROBERT, ÉDIT. PARIS.

WEST FRONT, ANGERS.

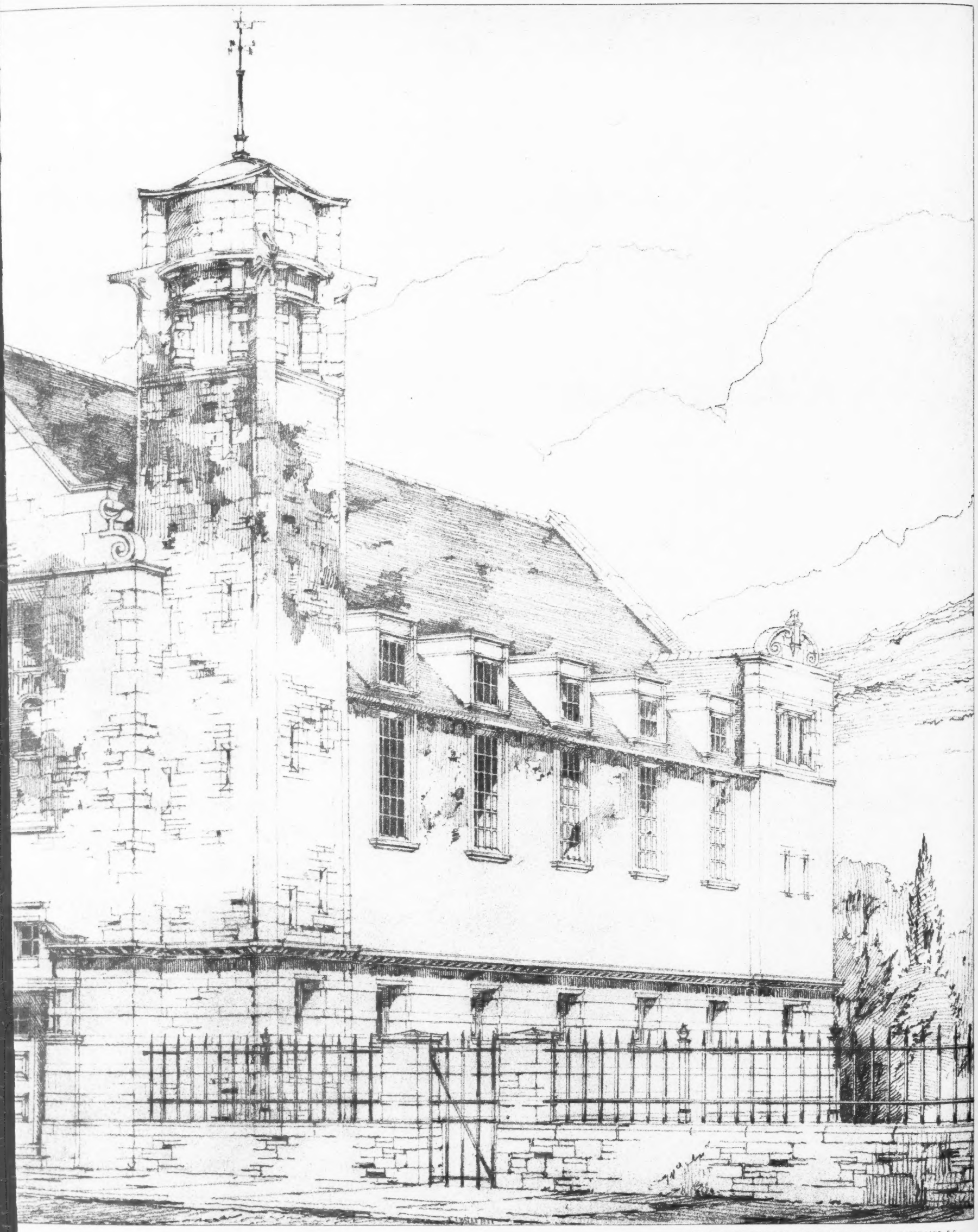
INK-PHOTO. SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PAUL ROBERT, EDIT. PARIS.

WEST FRONT, DIJON

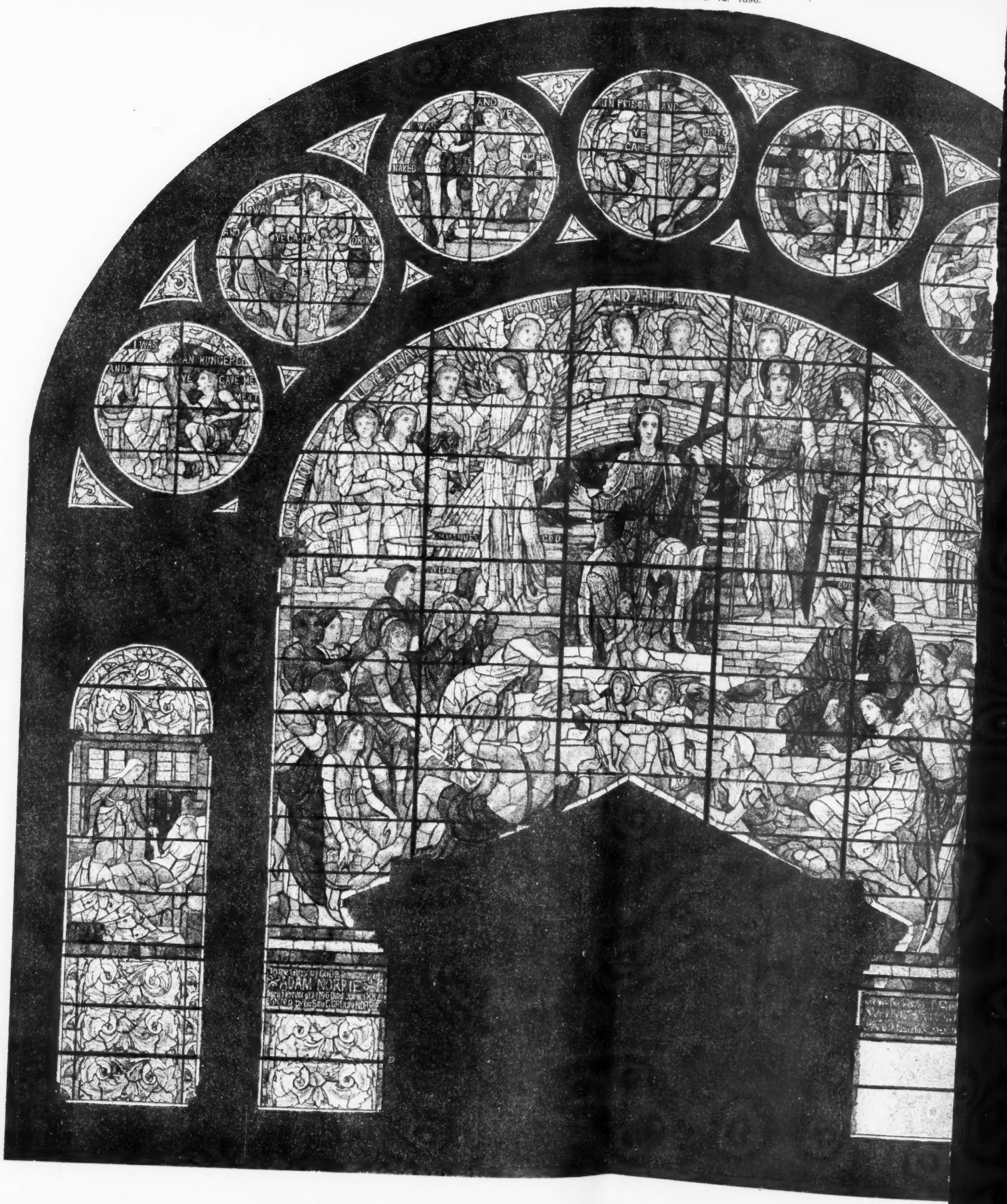


DESIGN FOR WESLEYAN CHAPEL, BLAINA, MON.—By Mr. William L. Griffiths.

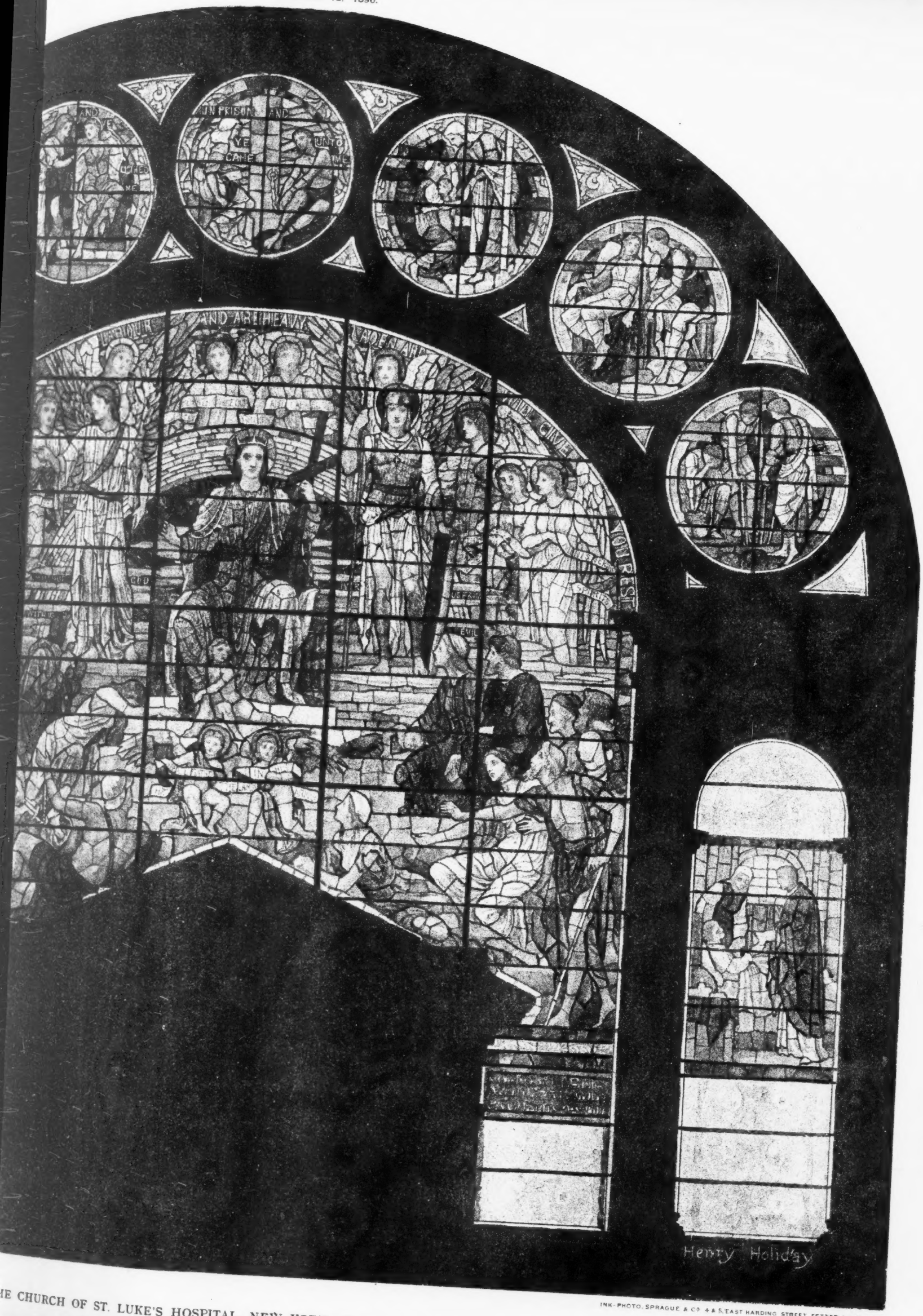


INK-PHOTO, SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

FOR WESLEYAN CHAPEL, BLAINA, MON.—By Mr. William L. Griffiths.



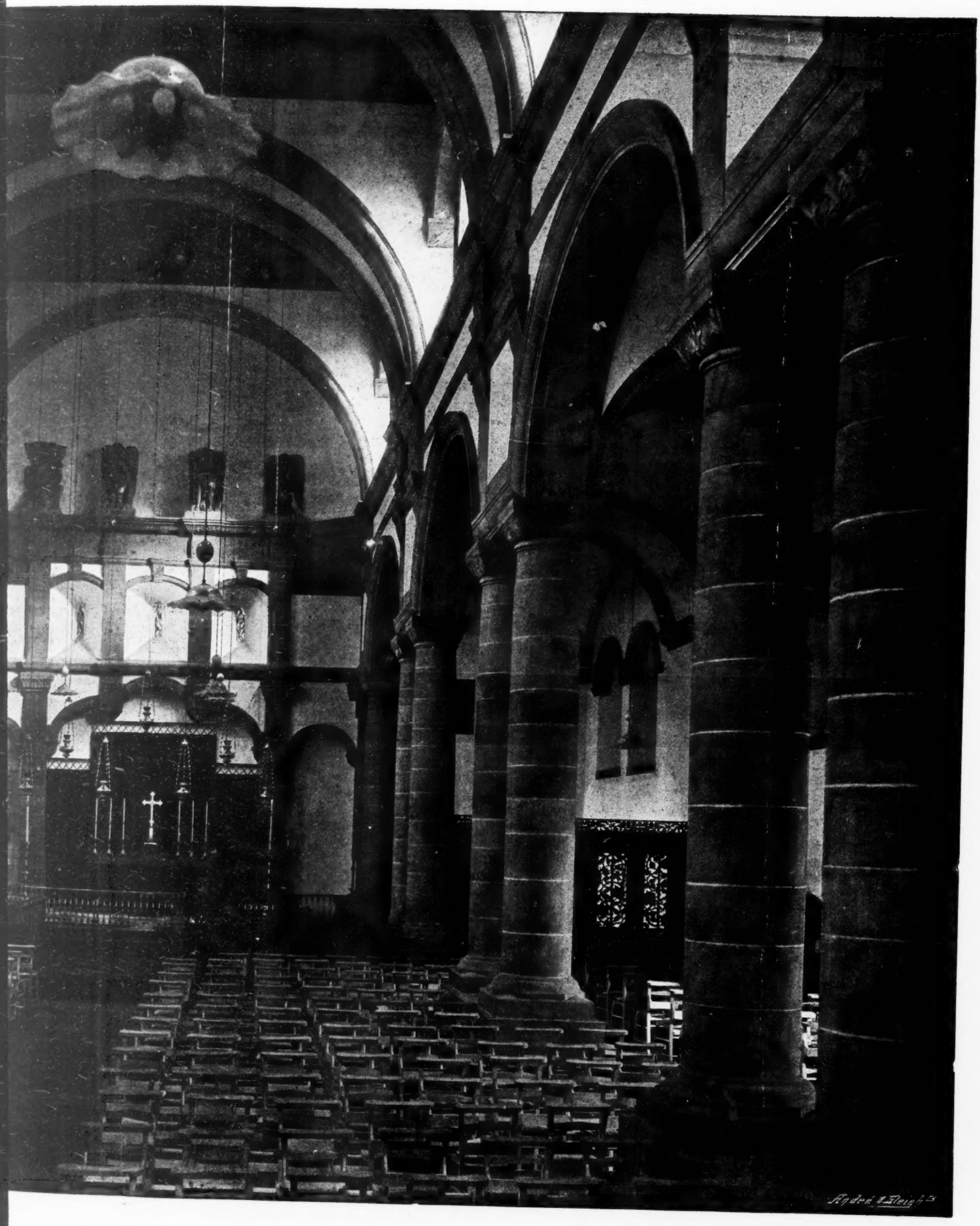
WINDOW OF THE CHURCH OF ST. LUKE'S HOSPITAL, NEW YORK.—DESIGNED BY MR. HENRY HOLIDAY.



INK-PHOTO. SPRAGUE & Co. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

HE CHURCH OF ST. LUKE'S HOSPITAL, NEW YORK.—Designed by Mr. Henry Holiday.

ST. ANSELM'S CHURCH, DAVIES STREET: INTERIOR VIEW.—Messrs. Balfour & Turner, Architects.



RCH, DAVIES STREET: INTERIOR VIEW.—MESSRS. BALFOUR & TURNER, ARCHITECTS.